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COMPUTERWORLD

IBM, Apple hammer out joint plans

BY JAMES DALY
CW STAFF

IBM and Apple Computer, Inc. executives worked to nail down the corners of their technology-sharing agreement last week and could reveal organizational specifics of the still sketchy joint venture as early as Wednesday, according to sources.

The pair's central announcement will concern definite plans to co-develop new operating system software. They will also reportedly establish a consumer market-oriented joint venture to develop multimedia software and a palm-size "personal communicator" that can read data from a compact disc as well as send and receive information via phone lines.

The former archrivals agreed to work together in July, but specifics about how the ballyhooed arrangement will work have yet to be made public.

Insiders said the joint organization will be located near Apple's Cupertino, Calif., headquarters. The operating system effort is expected to be headed

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With this issue:

Giant firms join outsourcing parade

$3B General Dynamics award is biggest ever

BY CLINTON WILDER
CW STAFF

ST. LOUIS — Dramatically staking out new territory in the outsourcing user and vendor landscapes, General Dynamics Corp. and Computer Sciences Corp. teamed up last week on a 10-year computer services contract worth an estimated $3 billion.

Surpassing Eastman Kodak Co.'s landmark 1989 outsourcing pact in both size and scope, General Dynamics will contract its entire information systems function, including applications development, to CSC. CSC will acquire 2,600 General Dynamics Data Systems Division employees and a nationwide data center infrastructure with capacity of more than 1,000 MIPS.

"We will be General Dynamics' IS facility, period," said Van B. Honeycutt, president of CSC's Industry Services Group. CSC will pay General Dynamics $200 million for its data centers and other facilities. General Dynamics will then pay CSC for

Continued on page 91

Defense cuts
General Dynamics' cost reduction plan gives Computer Sciences a $3 billion outsourcing contract and 2,600 new employees

GENERAL DYNAMICS

Headquarters: St. Louis, Mo.
Key data centers: Norwich, Conn.; Fort Worth, Texas; San Diego; Calif. (to be retained by CSC)
Top IS executive: Asaph H. Hall
1990 revenue: $10.2 billion; **loss:** $578 million
Total employees: 90,800
1991 IS spending: $503 million
IS staff: 2,600 to transfer to CSC; 800 to stay at General Dynamics
IS equipment value: $134 million; CSC will pay $200 million for General Dynamics' facilities and software

Source: *Computerworld Premier 100* — CW Chart: Michael Siggins

Costs drive decision at Continental Bank

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Continental Bank Corp. last week ended what Chairman and Chief Executive Officer Thomas C. Theobald a month ago called a search for "a great big vitamin shot" for its information systems department. Continental agreed to an outsourcing deal that would be the largest in banking history.

The bank refused to divulge the worth of the proposed 10-year contract with IBM's Integrated Systems Solutions Corp. unit, but a well-placed source said the deal would be worth about $700 million. Continental said it expects to save more than $100 million.

Under the terms of the preliminary agreement, ISSC will assume responsibility for computer and network operations at Continental, including all bank hardware purchasing and lease agreements. IBM and Ernst & Young will handle software maintenance and development.

Theobald told *Computerworld* in August that the bank's interest in outsourcing "is in achieving some kind of competitive advantage by tapping, better than we could on our own

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COMPUTER CAREERS

Gulf job hunters find the well dry

BY CHRISTOPHER LINDQUIST
CW STAFF

There is little gold in the Kuwaiti gold rush.

Despite an initial surge of enthusiasm by U.S. companies aiming to get a piece of the rebuilding action in the war-torn region, the dollars — and the jobs — have failed to materialize, experts say.

That may come as a disappointment to the ambitious information systems job hunters who flooded recruiters, engineering companies and computer firms with calls shortly after the war ended in February [CW, March 11]. The promise of virtually tax-free income, extravagant benefits and adventure were the biggest drawing cards (see story page 77).

"I don't see any real demand [for jobs in IS]," says Paul Konkel, managing director of the Arab Center for Organization and Management, which has an office in Riyadh, Saudi Arabia. Konkel also heads Search International, which handles Middle East job placements and has offices in Phoenix and Houston. He notes the majority of jobs that may appear in the near future will be related to the oil industry as Kuwait attempts to rebuild its shattered oil production infrastructure.

Observers cite several reasons for the low demand. Konkel says that during the war, reports indicated that more than 1.2 million people fled Kuwait. That exodus will result in a long-term

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Frame-relay fire ignites

BY ELLIS BOOKER
CW STAFF

SAN DIEGO — If the "nirvana of private networking is bandwidth on demand," as one long-distance telephone company official put it last week, then users are surely standing at the gates of a communications paradise.

Last week's Tele-Communications Association '91 conference here was dominated by talk about frame relay — not to mention services and products to support it. Frame relay is a fast-packet protocol that features flexible bandwidth allocation and four to five times the throughput of X.25 packet networking. Frame relay promises users a cheaper way of interconnecting local-area networks over wide-area networks.

"The economics of private lines go right out the window [with frame relay]. It's a private-line killer," said Berge Ayvazian, vice president of communications research at The Yankee Group in Boston.

Indeed, users focused on the economics of the technology. The first beta-test customer for U.S. Sprint Communications Co.'s offering — New York accounting firm Ernst & Young — was typical.

"We have around 200 offices, and the smaller ones could have never cost-justified dedicated links" into a corporate network, said Jeffrey Held, a partner at Ernst & Young's Network Strategies practice.

Like some users, Ernst &

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INSIDE

Cindy Charles

W. B. Seaton, American President's chairman and CEO, believes that competitive advantage from IS is only fleeting. See The CEO View. Page 59.

NEWSPAPER
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"No question the AT&T people we're bringing in will make NCR a stronger company."

CHARLES EXLEY JR.
NCR

On the effects of the merger.
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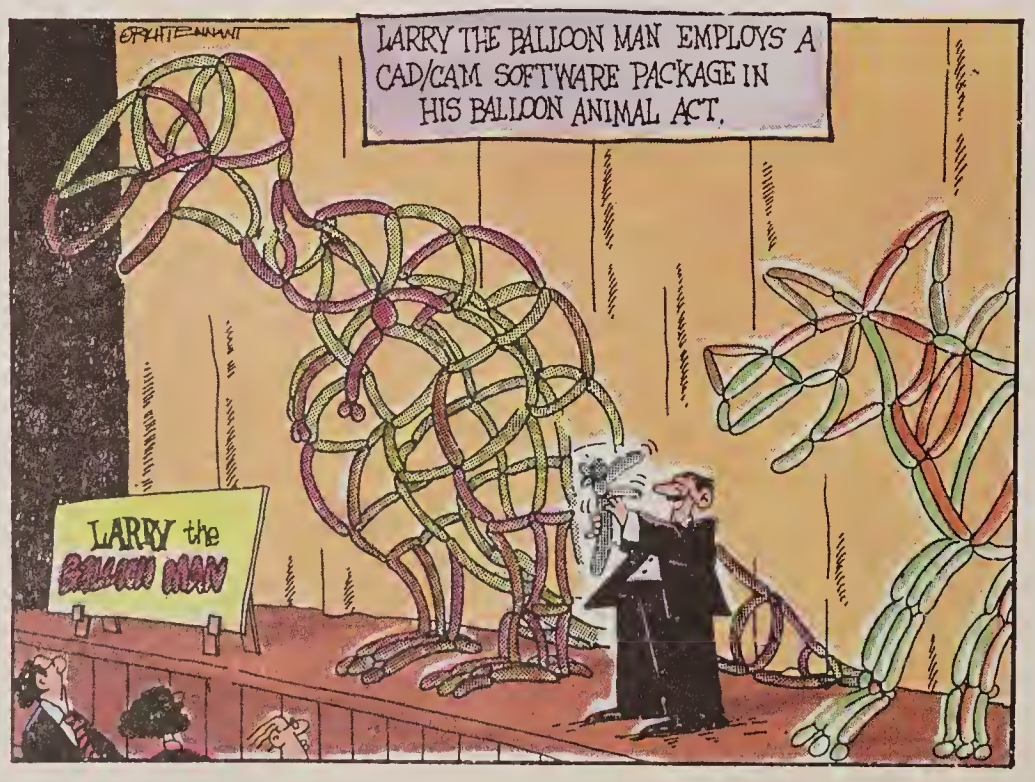
The 5th Wave



EXECUTIVE BRIEFING

■ **The ongoing recession has not stopped industry's best users of information technology** from faring surprisingly well: 58% of the *Computerworld Premier 100* companies got budget increases of up to 12% for the coming year, and many enjoyed newfound corporate respect. A whopping 92% say they will redesign business processes around information technology during the coming year. Federal Express, Banc One and AMR were ranked by their peers as the nation's best information systems organizations. **See our supplement.**

■ **A 10-year deal worth some $3 billion outsources General Dynamics' IS operations** to Computer Sciences Corp. and vaults past the 1989 Eastman Kodak/IBM pact to become industry's biggest outsourcing deal to date. Left in-house, General Dynamics said, the 2,600-person nationwide data center could have become a drain on the resources of the shrinking aerospace company. **Page 1.**

■ **Enthusiasts who predicted that job opportunities** would be ample in the war-torn gulf region have been wrong so far. **Page 1.**

■ **Chicago-based Continental Bank and IBM outsourcing subsidiary Integrated Systems Solutions are poised** to ink what could be the biggest outsourcing deal in the banking arena. **Page 1.**

■ **Vertical integration is not new to computer firms,** but traditionally, vendors have made the move into customers' or suppliers' markets through internal development. Now they are buying and allying their way in. **Page 71.**

■ **Telecom users could be in for a bandwidth bonanza.** Frame relay — a fast-packet protocol that features flexible bandwidth and promises up to five times the throughput of X.25 packet networking — dominated last week's Tele-Communications Association conference in San Diego. **Page 1.**

■ **Lotus says its new E-mail specification** will let developers build E-mail functions into software applications that will play on multiple platforms. IBM and Apple pledged support; Microsoft, competition. **Page 4.**

■ **IS managers can take legal contractual measures** to prevent vendors from placing software locks or disabling devices within systems. **Page 85.**

■ **IBM and Apple are set to detail** the operating system joint development aspect of their much remarked alliance. The former rivals will team up on a palmtop computer that can read data from a compact disc and relay it over phone lines. **Page 1.**

■ **Firms with mission-critical systems** are focusing on proving the "correctness" of software — that is, on being able to warrant that a complex piece of software does exactly what it's supposed to. Nice work if you can get it; most firms find they can't. That's a scary thought when you consider that software controls shutdown systems in nuclear power plants, on-board space shuttle computers and in vital business processes. **Page 65.**

■ **On site this week:** When state legislators beefed about the lack of long-range IS planning, Texas took heed. Today, the 2-year-old Department of Information Resources is on the first leg of a 10-year technology plan that will lead the Lone Star state into open systems, portability and scalability. **Page 31.** Welsh Water PLC in Brecon, Wales, is moving onto Unix platforms — in this case, Data General's Aviion — while protecting its investment in the likes of DG's proprietary MV minicomputers. The old and new are working together to supply pure water daily to 3 million people. **Page 32.**

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Lotus offers E-mail standard

Some firms greet the new specification with support, others with rivalry

BY CHRISTOPHER LINDQUIST
CW STAFF

CAMBRIDGE, Mass. — An electronic mail standards storm may be brewing. Lotus Development Corp. last week announced a specification designed to let software developers create applications with built-in E-mail functionality that will work across a variety of computing platforms.

While IBM and Apple Computer, Inc. announced support for the standard, Microsoft Corp. expressed surprise and said it is working on a Windows mail standard of its own. Network operating system vendor Novell, Inc. responded with a wait-and-see attitude.

A common interface would give software developers a "critical mass" of users to write applications for, allowing them to add mail functions to a variety of programs. "It's going to be a lot easier to send things around," said Esther Dyson, editor and publisher of the "Release 1.0" newsletter. Users could then send and receive a wide variety of data — such as spreadsheets, letters and schedules — from within an application without needing to leave the application or worry about the underlying E-mail package.

Welcomed by some

The Open Messaging Interface (OMI), for which a developer's conference is scheduled in December, has the support of both Apple and IBM and will reportedly show up in products within a year. However, Microsoft is proposing its own standard for a Windows mail application programming interface (API), and support for OMI from network operating system vendor Novell remains a question mark.

A spokeswoman for Apple indicated that support for OMI would be included in an upcoming version of System 7.0, which she said could be expected within a year. She added that Apple intends to work on making the standard "widely accepted in the industry."

John Soyring, director of OS/2 software developer programs at IBM, said IBM has been working with Lotus on the OMI specification for some time and will continue to do what it can to drum up support for the standard, including issuing a developer's kit once the specification is finalized in about 60 days.

Although Lotus quoted a Novell spokesman in the OMI announcement, Novell's enthusiasm was muted. Novell has no current plans to add OMI support to Netware, said Kanwal Rekhi, executive vice president of Novell's Interoperability Systems Group. However, he added, if user interest was high enough, the standard would be supported.

Bonnie Brown, project leader for office automation at United Parcel Service, Inc., stated, "Obviously, something like [a standard] is useful." However, she added that because UPS is a 100% Netware shop, Message Handling System "is fine for us." Microsoft has recently been soliciting comments on an E-mail standard of its own, and exactly if, and how, the two standards can coexist is a question that remains to be answered.

Currently, developers have to write their applications to conform to a specification set by the E-mail vendor, which is a problem because there are several such vendors with their own specifications. An OMI standard, if widely accepted, could change that by allowing a developer to write to one interface, confident that the application would be able to send and receive messages in several environments.

"The freedom to mix and match applications is an end user's dream," said Judith Rosall, electronic messaging program manager at International Data Corp. in Framingham, Mass. "Lotus should be applauded for taking a proactive stance."

Other analysts agreed but added that it may be some time before end users see any effects from OMI.

Unexpected development

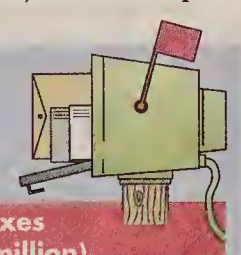
The announcement surprised Microsoft, according to Cameron Myhrvold, director of developer relations at the Seattle firm. "We set up three weeks ago about 50 vendors to discuss our early plans for a Windows mail API," he said. Lotus had been one of those vendors.

"If Lotus wants to propose this as feedback [to the Microsoft proposal], we'll certainly consider it the way we would consider feedback from any vendor," Myhrvold added.

Lotus has not ruled out working with Microsoft on the standard. Indeed, June Rokoff, vice president of communications and information services, indicated that Lotus plans to attend aMicrosoft mail standard meeting this month.

Take a letter

In an E-mail market dominated by "other," Lotus and Microsoft vie for leadership



1990 percent of total mailboxes installed worldwide (total: 3.3 million)

Lotus CC:Mail	23%
Microsoft Mail and Network Courier	17%
Da Vinci Systems Email	8%
Wordperfect Office	8%
Action Technologies Coordinator	7%
Other	37%

Source: International Data Corp.

CW Chart: Michael Siggins

Choosing Message Handling vs. X.400

BY JIM NASH
CW STAFF

Electronic mail administrators and analysts are offering the X.400 E-mail standard a qualified endorsement as a backbone for some messaging systems, according to a new report.

X.400 is accepted by many E-mail managers as the protocol all vendors should eventually support for all messaging platforms. In the meantime, IS departments are looking for less expensive and less complex ways of linking personal computer network-based E-mail systems.

The short-term answer many accept is Message Handling System (MHS), according to Nina Burns, principal at Network Management Solutions, a networking market research firm in Menlo Park, Calif. X.400 and MHS are the only nonproprietary messaging protocols that have application programming interfaces written for them, she explained.

Burns said she questioned E-mail support personnel at 49 corporations. Most managers, Burns added, felt the pool of technical support staff for X.400 is small compared with the price tag X.400-based systems carry.

Protocol of choice

In a report commissioned and published by Ferris Networks, Inc., a PC network research firm in San Francisco, Burns said firms are more comfortable using X.400 as a backbone protocol for mainframe and minicomputer messaging and electronic communications with their customers, suppliers and partners.

MHS is increasingly being accepted as a backbone for internal communications between PC-based messaging systems such as Microsoft Corp.'s MS Mail and Lotus Development Corp.'s CC:Mail.

"Expertise [with X.400] is hard to come by," agreed Steve York, manager of information exchange technologies at Los Angeles-based Hughes Aircraft Co.

Steve Bradbury, a systems analyst at Chevron Information Technology Co. in San Ramon, Calif., said there is a staff shortage for the systems. "Working out X.400 addressing can be difficult, but that's because people haven't cut their teeth on it yet," he said.

Darryn Shewchuk, messaging specialist at Microsoft's E-mail division, said X.400 is more expensive. Microsoft sells an X.400 gateway for $4,995 next to its MHS gateway, which costs $995. But X.400 is a broader protocol, and systems based on it outperform MHS.

X.400 "is not for the timid," said Carroll Pearson at Lockheed Missiles and Space Co. Pearson is Lockheed's information center manager and representative to the Aerospace Industry Association E-mail panel. The high price, she said, "is the price you pay for putting your company in a strategic position."

CORRECTIONS

Charles Wang is the chairman of Computer Associates International, Inc. He was misidentified in the Sept. 23 issue.

.....

Compaq Computer Corp. will not exhibit on the main floor at Comdex/Fall '91 [CW, Sept. 23] but has reserved meeting room space at the show.

Financial ratings for AT&T in the Aug. 12 Technology Analysis section referred only to the company's computer division prior to the merger with NCR Corp. The ratings for the company as a whole follow.

Analysts	Long-term stability	Short-term performance
Robert Wilkes, Brown Brothers Harriman & Co.		
Gary Hovis, Argus Research Corp.		

Key: Very good, Good, Fair, Poor

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Retiring Exley sees NCR/AT&T synergy

Outgoing NCR Corp. Chairman Charles Exley Jr. spoke to Computerworld *Midwest Bureau Chief Ellis Booker about the dramatic $7.4 billion takeover by AT&T that capped NCR's 107-year history last month.*

Exley retired as NCR chairman on Sept. 19, when the merger was legally completed.

Although Exley said he was unhappy the merger occurred "on my watch," he maintained that the combination of the two firms has made each stronger.

How should the industry judge the success of the AT&T/NCR merger? What time frame for this judgment is fair?

We'll see results from this consolidation following the first of the year.

In the middle of October, we'll be releasing a number of AT&T networking software and networking hardware products for the NCR sales organization. And we're gradually converting customers for [AT&T's] workstation line to our line. I think we'll be able to incorporate, from [AT&T's] Rhapsody, some work-flow automation features into [NCR's] Cooperation much earlier than had been expected.

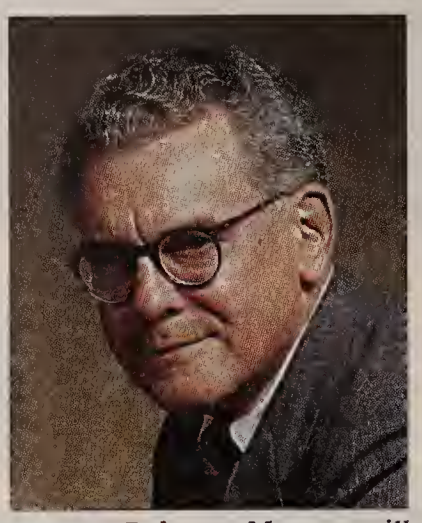
What do you think will be the biggest mistake people will make in evaluating the merger?

I don't think it'll be fair to blame things on the merger. AT&T has minimized the distraction to NCR management.

Any frets about the AT&T appointments to the NCR management team?

Well, you have to put this in perspective. Look at the size of AT&T Computer Systems a year ago. It had 10,000 people. We're taking in about 2,500 people. Second, there are a lot of outstanding people in AT&T Computer Systems.

You objected bitterly at first to AT&T's takeover bid, yet a few weeks ago, you praised AT&T's management, products and customer base. Where's the truth?



NCR's Exley: *Merger will strengthen both companies*

The truth lies in both places. I'm not happy NCR lost its independence on my watch. But if, on the other hand, you take it as a given that at $110 dollars, our shareholders wanted the company sold . . . I can't think of a better parent company than AT&T. There's a lot to admire at AT&T. They are a really outstanding group of people. No question the AT&T people we're bringing in will make NCR a stronger company.

What did the process teach you? Were you surprised by anything?

The development that surprised me was how weak the marketplace was for our product and that of the industry in 1991. For example, in the second quarter, the industry on the whole lost money . . . I didn't expect that.

Any surprises from AT&T during the takeover?

When I offered to recommend to the board an offer of $110, I was surprised they turned it down. At the time, they were up to $100.

What do you expect in 1992?

Bear in mind my record as a predictor . . . But things will be better. One of the main reasons is, new directions will become clearer to the user.

A big part of the slowdown [in the industry] is the change visible to the sophisticated user in virtually everything he does. For example, multiprocessor and parallel machines are more cost-effective than mainframes. But users want assurances the time is right to move to this new style of computing.

What are you going to do with yourself now?

[In addition to various director and trusteeships for several prominent institutions, including the Columbia Business School,] I plan to cultivate skills at loafing. I plan to do some extensive cruising on my boat.

New faces at NCR

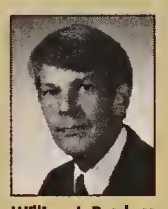
AT&T is well-represented in the new management of wholly owned subsidiary NCR. Here is a rundown of recent management appointments at NCR and where they came from

AT&T

From the AT&T side:

William T. O'Shea

William T. O'Shea, senior vice president of newly created NCR Network Products Group. Previously, he was vice president of systems marketing and development at AT&T Computer Systems Division.



William J. Patchett

William J. Patchett, president of the Telecommunications Division, which will sell computers to the telecommunications market. Previously, he was data sales vice president at AT&T Computer Systems Division and Network Systems.

Richard A. Cundari, division vice president of the Northeast Division, NCR United States Group (USG). Previously, he was regional vice president and general manager of the Eastern Region for AT&T Computer Systems Division.

James E. Clark

James E. Clark, assistant vice president of NCR's newly formed High Performance and Fault Tolerant Systems business unit, encompassing the 3B2, System 7000, Starserver and Starserver FT products. Previously, he was vice president of High Performance and Fault Tolerant Systems at AT&T Computer Systems Division and was that company's representative to Unix International.

Neil Whittington, assistant vice president of the NCR Multimedia Business Unit. Previously, he was director of AT&T Computer Systems Server Systems.

Anthony L. Barrese, assistant vice president of Architecture and Product Line Planning at NCR Network Products Group. Previously, he was director of systems planning and architecture at AT&T Computer Systems Division.

Matthew D. Balkovic, assistant vice president of the Networking Hardware Business Unit, including LAN and WAN products for the NCR System 3000. Previously, he was director of networking hardware at AT&T.

Ben Rasberry, vice president of the Western Division, Cooperative Marketing Division of NCR's USG. Previously, he was sales vice president and general manager of the western region at AT&T.

Robert W. Oliver, general manager of the X-Station Division of NCR's Applied Digital Data Systems. Previously, he was terminal and printer director at AT&T Computer Systems Division.

Carl Cirillo and John A. Pasqua, assistant vice presidents at NCR's Network Products Group. Previously, they were with AT&T's Network Systems Group.

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From the NCR side:

Gilbert P. Williamson

Gilbert P. Williamson, CEO. Previously, he was president of NCR.

Elton White, president. Previously, he was executive vice president of marketing.

Elton White

M. Y. "Joe" Stephan, vice president of corporate marketing and strategic planning. Previously, he was vice president of the Latin America/Middle East/Africa Group.

M. Y. Stephan

Anthony Fano, vice president of the Latin America/Middle East/Africa Group. Previously, he was vice president of retail systems marketing for the U.S.

Raymond G. Carlin, vice president of USG Retail Systems. Previously, he was division vice president of the USG Northeast Division.

Anthony Fano

CW Chart: Janell Genovese

IBM/Apple

FROM PAGE 1

by Metaphor Computer Systems, Inc. President David Liddle, with Apple Senior Vice President Ed Birss tapped for day-to-day operations.

Last week, Apple Chief Executive Officer John Sculley and IBM Vice President James Cannavino appeared together at the Agenda '92 conference in Laguna Niguel, Calif., to discuss a corporate marriage that Cannavino said would have been "unthinkable" only 18 months ago. Their presentation was short on specifics — including details about when products will arrive — but both executives agreed that the pace of change made the joint development effort necessary. "It's much more easy to be innovative when you're not on your own," Sculley said.

Cannavino added: "The buzzword for the '90s is 'time-to-market.' "

At the heart of the joint project will be development of the so-called "Pink" operating system. Sculley said Apple programmers have already written about 1 million lines of code and defined about 10,000 "classes," or basic building blocks, for the object-oriented system.

The collaborative effort is also expected to give Apple access to IBM's microprocessor technology as the pair teams up with Motorola, Inc. to produce a single-chip version of IBM's RISC System/6000 reduced instruction set computing-based workstation. The new machine will be scalable and licensed to other manufacturers, according to sources.

Equally important will be the venture charged with creating multimedia software and the handheld computer. "Both IBM and Apple realize that you can only go so far in extending the desktop PC metaphor," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh trade letter based in Alameda, Calif.

Apple officials have also hinted that the new company could cooperate on technology that would enable computers to send and receive data via radio waves.

The vague nature of the agreement, however, could leave an opportunity for others in the industry, such as Microsoft Corp. and Sun Microsystems, Inc., to step in and deliver products before the IBM/Apple joint venture does.

Analysts warned users not to expect technological fruit from the pact for several years. The agreement will first be subject to Federal Trade Commission approval, which could take months, and it will remain complicated even when the final blueprint is approved.

U.S. still firm on computer export restrictions

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Despite the fall of communism and much of the Soviet military threat, the Bush administration remains opposed to easing restrictions on the sale of advanced U.S. communications and computer equipment to Russia.

At a congressional hearing last week, administration officials appeared unmoved by arguments that the U.S. could help the Soviet economy and, with it, U.S. industry — at no cost to taxpayers or to national security — by liberalizing export rules.

Carleton S. Fiorina, a vice president at AT&T Network Systems, said the telecommunications infrastructure in the Soviet Union — built largely in the 1930s — is not in much better shape than the Communist Party. She said only 3% to 4% of the 13,000 calls placed each hour to the Soviet Union over the AT&T network are completed inside the country.

However, government officials pointed out that much has been done in the past year to ease export controls, particularly in a recent 50% reduction in the "core list" of controlled items. They also argued that the threat of Soviet military action is far from over.

"Changes in political character [after the Soviet coup attempt] do not automatically and immediately transform into changes in military character," said James M. LeMunyon, deputy assistant secretary for export administration at the U.S. Department of Commerce.

It is widely believed that U.S. intelligence agencies oppose Soviet use of fiber-optic networks because they are difficult to tap into for spying. "We still have serious national security concerns with allowing the export of state-of-the-art fiber optics," Christopher G. Hankin, deputy assistant secretary for international trade controls at the State Department, said at the hearing last week.

But in a subsequent interview, Chris Padilla, manager of government affairs at AT&T, said U.S. opposition is not limited to fiber-optic systems but includes any kind of advanced transmission equipment, even that based on copper coaxial cable. Why?

"It's classified. They won't tell us," Padilla said. "The only thing that from our standpoint appears to make any sense is that they are trying to limit the volume of calls on the Soviet telephone system."

Banyan plants stronger Vines

BY JOANIE M. WEXLER
CW STAFF

LOS ANGELES — Banyan Systems, Inc. fortified its enterprise networking strength last week with wide-area, network management and directory services tweaks to its Virtual Networking System (Vines) network operating system. The enhancements were announced at the Association of Banyan Users International conference here.

The Westboro, Mass.-based vendor introduced Vines Version 4.11, which includes a $995 option that allows multiple personal computer users to dial into a Vines server over a single X.25 connection. The option is slated to ship Nov. 1.

"This wide-area stuff is really important to us," said Tim Neumann, a consultant in the office of operations, technology and development at Johnson & Johnson, a global Banyan shop headquartered in New Brunswick, N.J. "It will improve the functionality of salespeople in the field using laptops by 200%."

Banyan Vines Assistant, a $699 package of local-area network administration utilities, is scheduled to ship next month.

Vines Assistant allows network administrators to modify global network configurations, automate maintenance tasks and monitor their server capacity. However, "We don't yet have a facility for limiting space on a per-user basis, which has been widely requested for Vines," said James Martin, information systems technical consultant at Nissan Motor Corp. in Gardena, Calif.

The vendor also announced support for the Simple Network Management Protocol, an industry de facto standard that will allow Banyan users to manage a mixture of Vines and other LANs.

One refreshing surprise, according to Neumann, was an enhancement to Banyan's already advanced Streettalk global directory service. Streettalk Attributes allows users to identify groups of individuals within the Streettalk database. For example, "I could tag categories of users who should receive certain software updates," Neumann said.

Banyan also announced that it has certified the AT&T Starserver E as a Vines server.

Robert Lem, a senior associate at consulting firm Boston Systems Group, sees the Banyan announcements as consistent with the marketing buckle-down the company committed to last year. "Banyan is being realistic about blending with other vendors," he said. "For them to prosper in the next decade, they must talk to other environments."

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NEWS SHORTS

CA completes On-Line acquisition

Computer Associates International, Inc. completed its $127 million bid to acquire On-Line Software International, Inc. last week, buying more than 90% of On-Line's outstanding shares for $15.75 per share. On-Line, based in Fort Lee, N.J., will help fill in CA's CICS, DB2 and computer-aided software engineering product lines. In December, CA will provide On-Line customers with a statement of direction describing its short-term and long-term product plans.

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Network editions for 1-2-3 ship

Lotus Development Corp. has announced that 1-2-3 Release 3.1+ is now available in Standard, Network Server and Network Node editions. The Standard edition, which is intended for users of stand-alone systems, shipped in July. The Network Server edition, with a retail price of $895, is licensed for a file server. Additional user licenses can be purchased for a retail price of $595 as Node editions, which include documentation only.

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McData clones IBM processor

Yet another IBM communications processor was cloned last week as McData Corp. announced a system-compatible version of IBM's 3172 Interconnect Controller. The Broomfield, Colo.-based vendor announced that it has configured its Linkmaster 6100 to duplicate the 3172's ability to act as a multiprotocol gateway between Ethernet devices and IBM Systems Network Architecture (SNA) hosts. According to the company, the 6100 can reportedly take over the job of translating non-SNA protocols to SNA and can communicate with IBM hosts over a Token Ring network.

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Harvard Draw challenges Corel

Software Publishing Corp. will take on the likes of Corel Draw when it announces a Microsoft Corp. Windows-based drawing package Wednesday. Sources familiar with the product said Harvard Draw, although an easy-to-use program packing a lot of power, will be positioned more in the mainstream than high-end Corel. Among the features winning kudos for Harvard Draw, which is expected to sell for about $600, are a font-styling tool that lets users shape text in a curve and a color palette that can be customized.

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AT&T $1.4 billion award blocked

A federal contract appeals board has at least temporarily blocked a $1.4 billion award to AT&T and its subcontractor Pyramid Technology Corp. for workstations and servers for the Internal Revenue Service. IBM, which protested the award, and its partner Arix Corp. turned in a $708 million bid, and the appeals board said the IRS had failed to show that the AT&T contract justified the higher price. AT&T, IBM and Lockheed Corp., which also bid for the IRS contract, are still eligible for the award.

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DEC exec moves to HP unit

Digital Equipment Corp. lost another executive from its management team last week, this time to competitor Hewlett-Packard Co. in Palo Alto, Calif. Gary B. Eichhorn, 37, formerly vice president of DEC's General Systems Business Unit, will be the general manager of HP's Workstation Business Unit.

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Developers clash over copyright

Accounting software developer Gejac, Inc. in Laurel, Md., is suing competitor Computer Information Systems, Inc. for alleged misappropriation of trade secrets and copyright infringement. Gejac, which makes the Arsap software package for DEC VAX/VMS systems and Unix-based computers, obtained a federal court order restraining Newton, Mass.-based Computer Information from using or disclosing confidential information about Arsap.

More news shorts on page 90

Smart hubs vie for attention

BY JIM NASH
and JOANIE M. WEXLER
CW STAFF

The latest round of smart-hub wars found 3Com Corp. and Ungermann-Bass, Inc. leapfrogging their competitors last week with heavy-duty product rollouts intended to accommodate imaging, multimedia and other bandwidth-hogging applications.

The vendors were hot on the heels of Synoptics Communications, Inc. and Cabletron Systems, Inc. with the addition of 100M-bit/sec. Fiber Distributed Data Interface (FDDI) modules to existing local-area network hub modules.

They then went a step further by announcing integral multiplexing and packet-switching hub architectures to accommodate high-speed local- and wide-area applications and technologies coming down the pike.

Industry observers were divided about near-term demand for the products, which parallel movements in the router industry for high-performance, fault-tolerant internetworking.

"The hub vendors are in a technology battle of fast-switching, whiz-bang ideas," said Janet L. Hyland, director of network strategy research at Forrester Research, Inc., a consultancy in Cambridge, Mass. "They are in a race that impacts very few customers in the short term."

"There is a perception in some areas of our company that we need FDDI, but they have not provided enough justification for it," said Robert Mobley, supervisor of end systems for the western region of Chevron Information Technologies in San Ramon, Calif.

Intense applications

However, a UB user said his company is doing "everything but full-motion video to the desktop today. We're transmitting images, electronic mail and fax and doing financial modeling across the network," said Bruce A. Russell, a technology architect at Amex Life Assurance Co. in San Rafael, Calif.

Matthew Collins, network administrator at Amex, noted that the company switched from Synoptics to UB equipment in January because of UB's blueprint for high-speed support. "Everybody else will have a high-speed backplane a year from now," he said, "but Ungermann-Bass is making what we bought interoperable with upcoming products."

That move gives the firm an edge over 3Com, said Charlie Robbins, director of communications research at Aberdeen Group, a consultancy in Boston. "It's very, very important that users don't have to change anything out."

3Com and UB are positioning their hub architectures as "enterprise" hubs. 3Com's Linkbuilder 3GH (Third-Generation Hub) is built on reduced instruction set computing (RISC) technology from Synernetics, Inc. in Billerica, Mass., and links up to 88 "private" Ethernets over FDDI.

The approach is intended to breathe more life into users' existing Ethernets by sidestepping the limitations of Ethernet's contention access method and easing the migration from Ethernet to pricey FDDI. The multiprotocol bridge/routing module for the 3GH is 3Com's high-end Netbuilder II, also announced last week.

UB has brought the concept of fast-packet switching to its RISC-based hub architecture to ease network bottlenecks. The firm is integrating the switching architecture with high-end multiprotocol bridge/routing from Advanced Computer Communications, Inc.

Unlike the high-end routers in 3Com's and UB's hubs, those in Synoptics and Cabletron hubs are Cisco Systems, Inc.'s low-end offerings.

Pilot sketches details of networked EIS plan

BY KIM S. NASH
CW STAFF

BOSTON — Pilot Executive Software provided a peek last week at two unreleased parts of its three-pronged executive information system (EIS) strategy for local-area networks, scheduled to be announced today.

Analysts said the plan is a flexible LAN-based system that, in some respects, outpaces offerings from rival Comshare, Inc.

In September 1990, Pilot released the first product in the plan: Lightship, a Microsoft Corp. Windows-compatible front end. Mid-October is the projected ship date for the second product, Lightship Lens, which is a computation engine that sits between Lightship and Timebase, Pilot's new database.

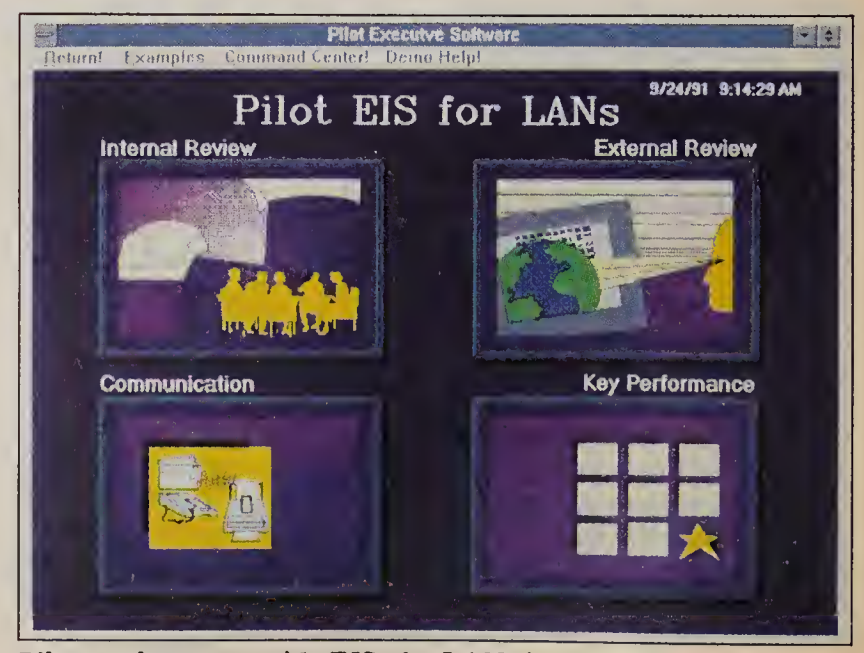
Timebase, a multidimensional, time-series database, is being beta-tested and is scheduled for release in December, said David Friend, Pilot's chairman and chief executive officer.

Timebase stores data in a cubelike setup. It is "time intelligent," said Cliff Conneighton, an analyst at Stamford, Conn.-based Gartner Group, Inc. That means the database understands the concept of days, weeks, months and so on without having to be reprogrammed to group information according to time. No price was available.

Lens crunches information on the fly from personal computer applications and databases on the LAN. "Pilot has really taken advantage of the Windows' Dynamic Data Exchange feature," Conneighton said. Lens costs $195. All three components together reportedly let users ask several-part questions and get a response in a few seconds, Friend said.

Lightship, which costs $795, is the only major EIS currently available that can run under Windows 3.0, Conneighton said. Comshare is working on a Windows version of CommanderEIS.

Pilot's components run on PCs and servers, thwarting a criticism of mainframe-based EISs, said Clare Gillan, an analyst at International Data Corp. in Framingham, Mass.



Pilot's plan *to provide EISs for LANs includes such products as multidimensional Timebase and Lightship Lens*

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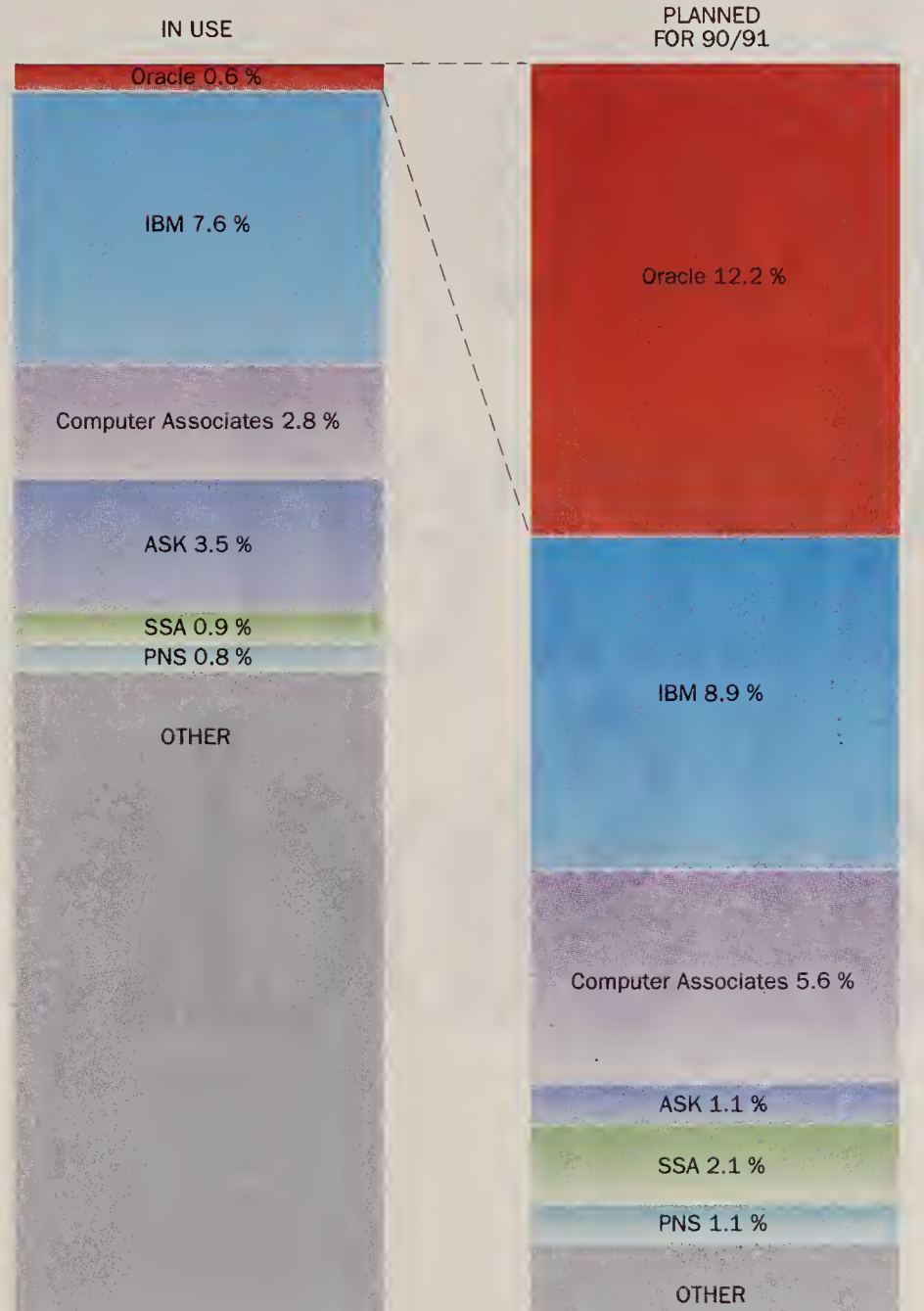

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New Wave joins Windows

BY J. A. SAVAGE
CW STAFF

After two years of being unable to broadly market its PC software shell, New Wave, Hewlett-Packard Co. last week threw the product in with Microsoft Corp.'s Windows, on which New Wave is based.

The move will benefit users because it will make it easier for developers to port to New Wave, according to software developers and analysts.

Both New Wave and Microsoft's Object Linking and Embedding (OLE) allow personal computer applications to interoperate and provide for automatic updating. Both run on top of Windows 3.0.

According to Viktor Grabner, technical evangelist at Microsoft, the company is simply counting HP as one of its retinue. He said the company will treat HP no differently than the "several" other software companies with which it is collaborating for Version 2.0 of OLE.

Developers said HP has had trouble persuading them to port applications to New Wave, although they acknowledged that New Wave is superior to Windows. Significant work was required to reach a relatively small user base, they said. "The port is a lot of extra work, but not a lot of sales are actually occurring," said Grant Wickes, manager of marketing planning at Micrografx, Inc. in Richardson, Texas.

HP hopes that working with Microsoft will enable it to combine most New Wave functions into the next version of OLE, according to Webb McKinney, general manager for HP's Cooperative Object Computing Division. The goal for the next version of OLE, OLE 2.0, is the third quarter of next year, Grabner said.

With OLE, developers had only to port their applications to Windows and OLE to get similar features and reach an estimated 5 million Windows users.

Applications developers and users such as Joel Diamond, technical director at the *Windows User Group Network Technical Journal* in Media, Pa., said New Wave is more robust technology than OLE. New Wave not only allows applications to interoperate but also permits files to be automatically updated across a network. OLE will do only one or the other, not both, Diamond said.

Despite Diamond's claim that OLE "is only half of what New Wave has been," Microsoft's market success is enticing. "HP knows how to develop but not to market," said Jeff Mallett, vice president of sales at Reference Software International in San Francisco.

The deal means more work for HP, which will write a layer of software that will translate OLE system calls to New Wave system calls. But without extra effort by the developer, users will not be able to take full advantage of New Wave functions such as building sophisticated office routines through the Agent facility.

Still, users should see more applications available on New Wave. With OLE 2.0, developers will have to do only about one-tenth as much work to get from Windows to New Wave as they would have before, according to Diamond.

DEC to unveil EDI products

BY JIM NASH
CW STAFF

Digital Equipment Corp. is reinforcing its position in the electronic data interchange (EDI) market with new products and services due out later this fall. The announcements have not raised users' expectations of greater EDI acceptance, but information systems managers said they would be interested to see how DEC's products compare with existing tools.

The Maynard, Mass.-based computer maker last week introduced Filebridge for DEC/EDI, software that integrates EDI forms with business applications via DEC/EDI application, translation and communications servers. DEC also announced DEC/EDI Version 1.1 and services to ease initial EDI setups and upgrades.

"This will give [DEC] a firm foundation in EDI," said Mike Johnson, technology manager at Welty-Leger Corp., a Waltham, Mass.-based consultancy. DEC's move would be one of the first substantial steps taken since DEC/EDI appeared about a year ago, industry observers said.

Filebridge will ship in November for $11,500, DEC said. DEC/EDI Version 1.1, due to ship next month, will be based at $10,000 and add support for DEC Vaxclusters and X.25 packet switching at Tradacoms, a European EDI standard.

Filebridge "addresses something many people have been fighting with: What do you do with the EDI [message] when it comes in?" Johnson said. He said some companies re-key EDI information.

Those companies are not using true EDI, said Mark Kamens, manager of IS at Citizen Watch Company of America, Inc. Kamens said vendor-made and custom applications bridge external EDI communications and internal programs.

The key to DEC's success, Kamens said, would be minimizing the programming needed to get that electronic flow moving. "We would definitely be interested in taking a look at it," he said.

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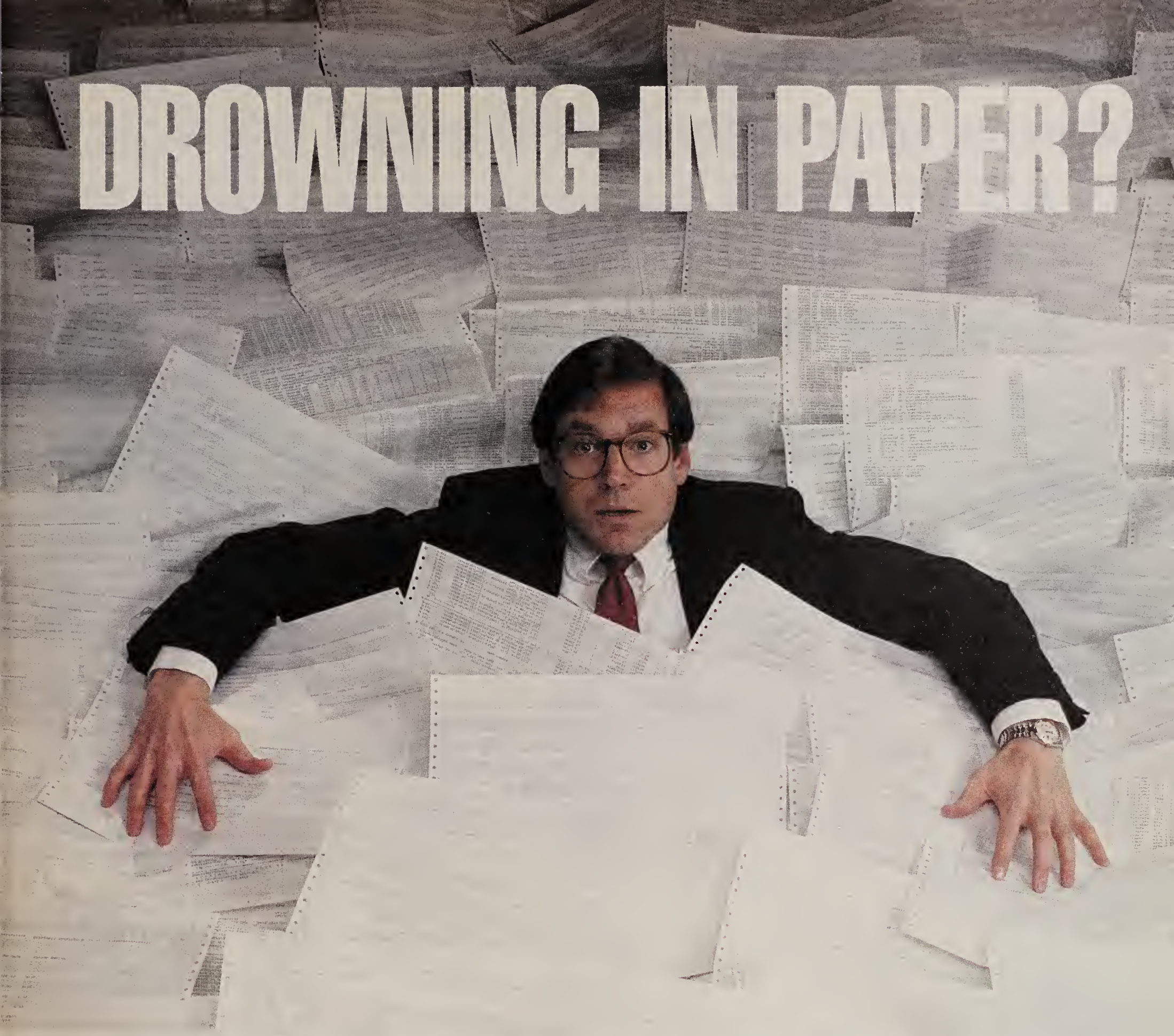

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Slimmer and lighter laptops easy theft targets

BY MICHAEL ALEXANDER
CW STAFF

Laptop computers have slimmed down considerably in recent years even as their capacity to store data has been pumped up. It is not uncommon for a sleek notebook machine to be equipped with a 40M-byte hard disk drive, enough to store a complete set of encyclopedias with room to spare, for example.

However, smaller size and greater capacity may not be all good.

Information systems managers and others responsible for computer security should be more concerned about securing the information stored in these portable electronic warehouses, according to Chris Tubis, senior vice president of sales and marketing at Beaver Computer Corp.

Portable computer data security "wasn't a problem 18 months ago, before the introduction of portables with very big hard disks," Tubis said. Also, the enormous popularity of notebook computers has magnified the risk that data could be lost or stolen.

Last week, Beaver Computer introduced a notebook computer that the company declared is the first to address a mounting security concern on the part of government and commercial IS managers. The SL007 notebook can be equipped with a coprocessor that uses the data encryption standard (DES) to scramble and unscramble data en route to and from a hard disk drive. DES is widely used by the federal government, but few commerical users have found reason to adopt the technology.

The 7-pound notebook, based on Intel Corp.'s 80386SL microprocessor, features a 62M-byte hard disk drive and a 9.6K bit/sec. fax modem and is priced at $4,995; the DES coprocessor at $995.

Security risk was highlighted during the Persian Gulf war when a laptop containing U.S. Army General Norman Schwarzkopf's attack plans was stolen from a British Royal Air Force officer's car in London. The laptop was recovered several days later. The embarrassment prompted British Defense Ministry officials to order the replacement of thousands of laptops with machines featuring removable hard disk drives.

IS managers contacted for this story confirmed they are concerned about the loss or theft of portables, but they are mainly worried about losing machines rather than the data stored in them.

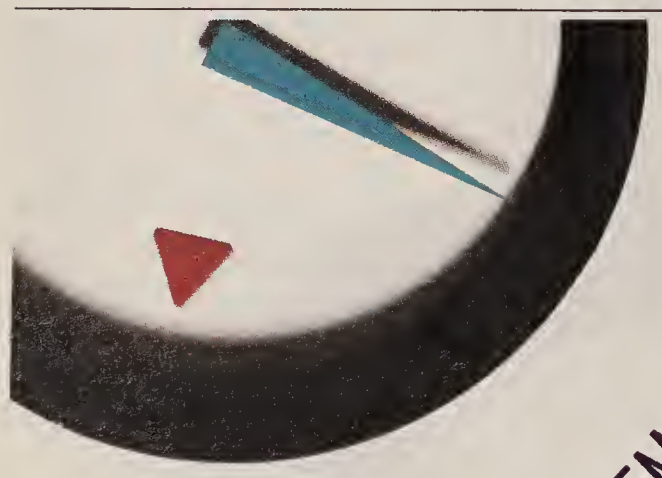
Costly crime

Laptops are easy to steal and costly to replace, said Dick Nelson, a vice president at New York Life Insurance Co. Data can be protected by password programs and by following proper security procedures, he added. There is no protection, including software encryption schemes, that will stop a thief who wants to steal company secrets stored in a laptop, he said.

DES is virtually foolproof, and software protection schemes can be easily circumvented, several security experts said. Portable computer security is a concern, but password protection and other security controls provide adequate protection, said Edward Fink, director of Metropolitan Life Insurance Co.

"DES is a nice idea, but I am not sure about the price ticket. It's high," Fink said.

The theft of portables and the data they contain is a growing problem, but it is not a significant enough threat to warrant paying "a $995 kicker" for DES protection, said George Caldwell, a noted security expert and president of Caldwell Security Associates in Haymarket, Va. "DES encryption is more than what most folks want or need."



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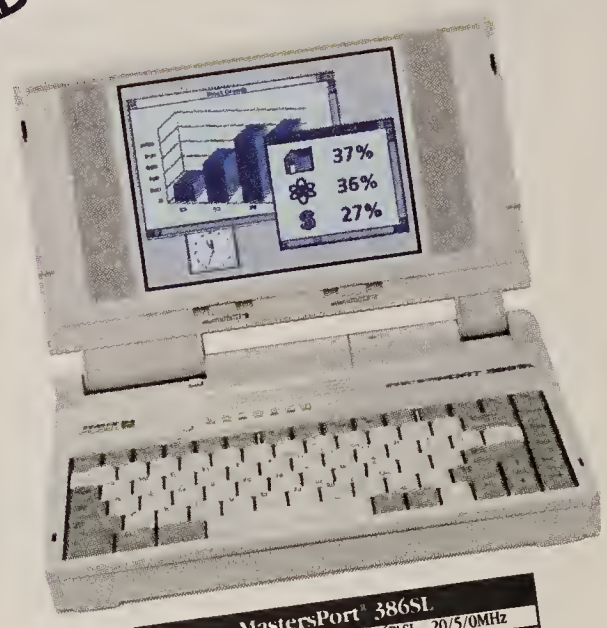

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Intel chip to fill gaps for ports

BY JIM NASH
CW STAFF

Intel Corp. is pulling its microprocessor products in different directions to fill a gap for portable computers. Last week, the company announced a slightly faster 80386SL and lower powered versions of its I486DX and I486SX microprocessors.

While Intel deliberates on how it will handle power management on a future I486 chip built specifically for portables, it is introducing a new 25-MHz 80386SL to complement the existing 20-MHz version. Intel claims a 25% performance boost at the new chip speed.

At the same time, Intel said it has cut power consumption by one-half to three-quarters on the 25-MHz I486DX as well as the 16-, 20- and 25-MHz I486SX.

Jim Chapman, entry-level product marketing director at the Santa Clara, Calif.-based company, acknowledged there may be some changes to the I486's portable version. Chapman said Intel is debating whether to copy the power-management scheme used in the SL or SX chips.

A spokeswoman for AST Research, Inc. in Irvine, Calif., said the lower powered I486 chips will allow AST to cut battery weight by as much as half. She refused to say when the chip would be incorporated into AST's portables.

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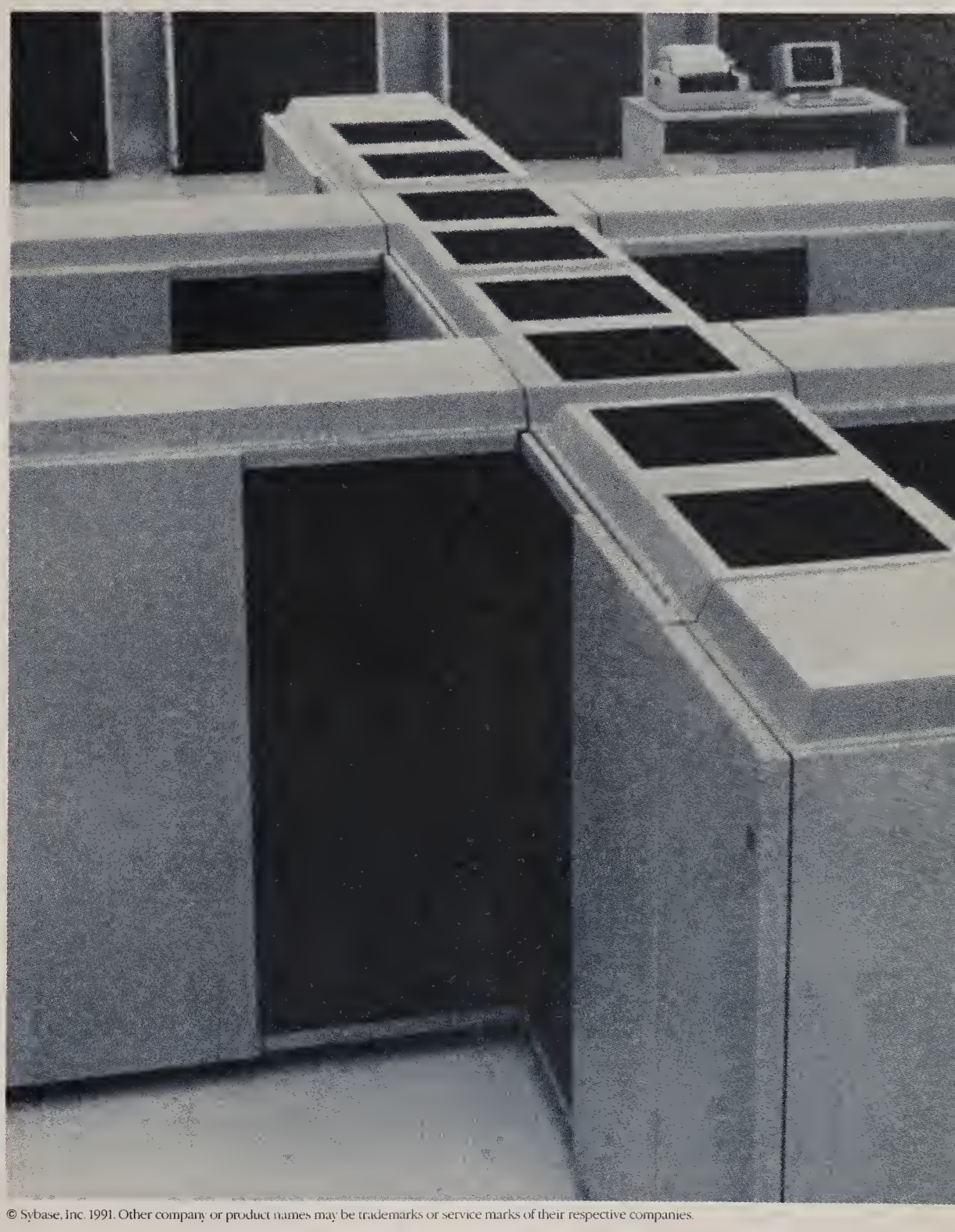

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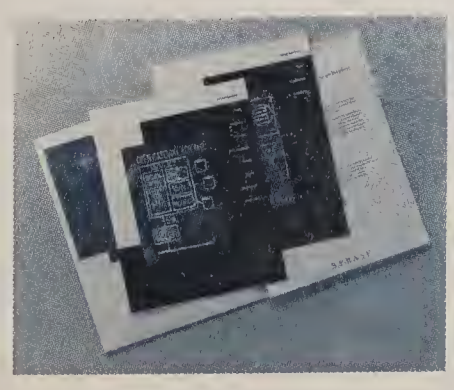

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Bank merger may result in IS layoffs

BY NELL MARGOLIS
CW STAFF

After three months of halting negotiations and a brief derailment at the hands of federal regulators last week, Bank of Boston Corp. and Shawmut National Corp. are expected to announce today a plan to weld the two troubled banks into a $56 billion colossus.

However, the deal that will create New England's largest bank will also swell the region's unemployment lines — and information systems staff members will be among the hardest hit, analysts said.

"I expect to see layoffs in the 3,000 to 4,000 range — and a lot will come from information systems," said Gerard Cassidy, a banking analyst at Tucker, Anthony, Inc. in Portland, Maine. Between them, the banks currently have some 30,300 employees.

"You're putting together two banks with impaired balance sheets, each with a load of nonperforming assets," noted Nancy Bush, a banking analyst at Brown Brothers Harriman & Co. "The only way to get out from under is to cut costs early and to cut deep." Technology, Bush said, "is always one of the first areas to be cut."

The merger could also cast into limbo a bold five-year technology integration blueprint drafted by Bank of Boston IS Vice President Michael Simmons [CW, Dec. 10, 1990]. Since his arrival in the top IS post in the spring of 1990, Simmons has been spearheading a plan to pare a sprawl of multivendor platforms, isolated applications and unrelated local-area networks into an efficient bankwide network.

Simmons said he was unable to comment on the possible merger plans or any results that might stem from such an event; nor would a Bank of Boston spokeswoman offer any comments. Efforts to reach Shawmut were unsuccessful.

"I don't think the strategy behind any of those efforts is going to be put on hold," said John Heffern, a bank analyst at Alex. Brown & Sons, Inc. "But it might be back to the drawing board for the tactics."

Kavin Moody, former director of information services at Bank of Boston, was involved in early iterations of the Simmons initiative. Now an executive at Framingham, Mass.-based Technology Investment Strategies Corp., Moody speculated that postmerger revisions of the blueprint could go beyond the tactical level.

The combined banks "may want to step back and repeat the whole technology evaluation process," Moody said. "They will need to reinventory everything. Shawmut may have some better pieces in some areas."

"I'm not certain what Shawmut really has" by way of IS, Cassidy said. Several analysts noted that Shawmut has maintained a low profile with regard to its IS operations, which won the Hartford, Conn.-based bank 98th place in the 1990 *Computerworld Premier 100.*

"If you're an optimist, you'll believe they're going to look at every alternative and choose the best one, no matter which bank it came in with," Cassidy said. "If you're a realist, you'll assume that Bank of Boston's technology will win out because they're the buyers."

Oracle is back on profit track

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. claimed last week that it was on the road to economic recovery.

A year after its first-ever quarterly loss, the $1 billion software firm announced a slight profit of $2.4 million on $245 million in sales for the quarter ended Aug. 31. That compares with a net loss of $29 million on $215 million in sales for the first quarter of fiscal 1991.

"The average expectation on Wall Street was that we would have a slight loss this time," said Michael Musson, Oracle's director of investor relations. In fact, sales were down by 18% from the previous quarter's $287 million figure. Collections of past-due customer bills provided most of the $46 million in positive cash flow this quarter, Musson said. Total debt was $127 million, $100 million of which is owed to a banking syndicate that wants to be paid by tomorrow.

Industry analysts were pleased with the news. "They had 14% revenue growth [compared with last year], which isn't bad for a $1 billion company in the middle of a recession," said Charles Phillips, a vice president of research at Soundview Financial/Gartner Group, Inc. in Stamford, Conn.

However, Phillips and others are waiting to see if Oracle accepts $200 million in financing from Nippon Steel Corp., a deal placed on hold [CW, Sept. 9] while Oracle reviews how Nippon Steel could reuse Oracle's proprietary technology in its Japanese systems integration business. Oracle is expected to comment on the Nippon Steel investment this week.

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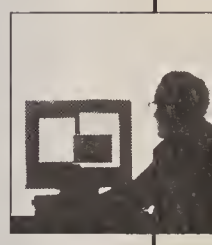

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When productivity falls, it's a people problem, right?

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White collar productivity rose less than 1% per year during the 1980s.

And in 1989 and 1990, it actually declined.

Clearly, throwing more people, or different people, at the problem doesn't solve it.

But something else does. Something unconventional.

There are dozens upon dozens of enterprises—companies, government agencies and universities—which have made dramatic gains with essentially the same people working in their offices and departments.

In the credit card division of a major financial institution, customer service response time was slashed from as long as four days to just minutes.

In the accounts payable department of a leading consumer products company, the time it took to file in-coming checks, invoices and requisitions went from a two-to-three-month backlog to instantaneous filing the moment they arrive.

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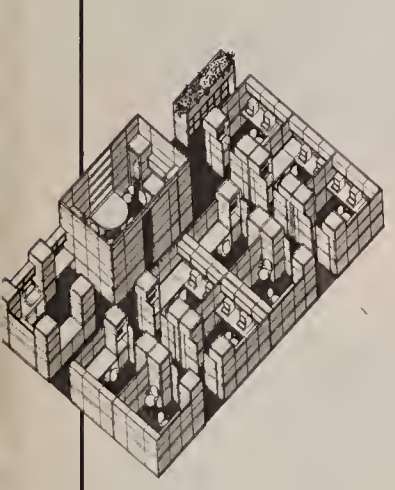
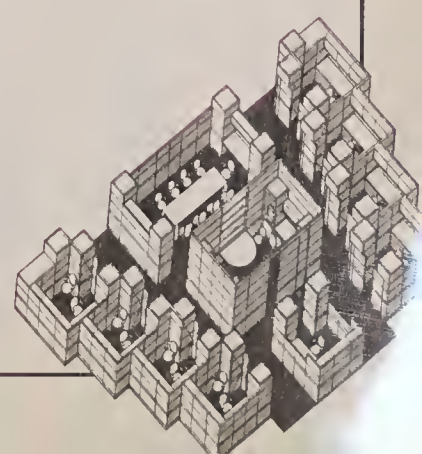


WANG



It fell from the night sky undetected. By morning, it was pushing up innocuously through the moist, warm soil. Perfect. For the entire world would certainly take note soon enough.

In the oxygen-rich environment of earth, our little interstellar transplant experienced accelerated mitosis. On the first day it increased its height by half. On the second day by a third, on the third day by a quarter and so on. Can you determine, at this rate, how long it'll take to achieve its final height of one hundred times its original height?

Keep in mind, as you size up this visitor, that the rate of growth may seem greater at first. As is often the case in business, early growth can be markedly stronger when a product category is new and innovation is rapid. But it can flatten out as the market swells and matures.

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Case in point, personal computers. Meteoric sales at first. Then a slowing. Today, growth is still there, but the incline is less steep. And there are some 300 brands fighting for that sluggishly growing chunk. If it weren't for the surge in notebooks, PC growth would probably be flat as a floppy.

So why on earth, in the midst of all this, would Wyse dare introduce just another line of PCs? We wouldn't. Our Decision Series is a far cry from just another line. With more performance, more flexibility and more ergonomic advantages at–it's true–less cost. All backed by a total service program.

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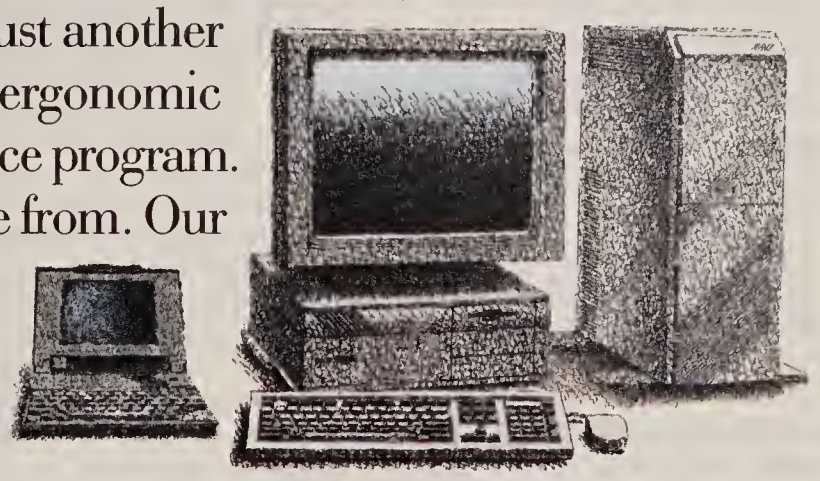

From notebook to tower, the Wyse Decision Series PCs offer a rich assortment of features and ergonomics at more than competitive pricing.

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Of course, the introduction of our *Unix World* award-winning 9000i helped change things. This 160 MIPS, multi-user, true symmetric multiprocessor system makes it very clear that Wyse is a bit more than just the second largest terminal manufacturer.

The recent introduction of our eyebrow-raising DecisionMatesx notebook PC should help bring further clarity to the picture. As should this little nugget: according to information released by International Data Corporation in December 1990, guess who ranked second behind only IBM as the primary vendor of PCs to value added resellers? The correct answer appears below in fairly large capital letters. As to the correct answer regarding our mutating extraterrestrial, well, you'll need to turn to page 75 for that.

To receive more information on any of the Wyse Decision Series PCs, and/or a free poster of further Cerebral Aerobics, just call us at 1-800-GET WYSE.

The lesson in all this: if you're contemplating the acquisition of some new terminals, do as you'd normally do and look into Wyse.

If you're contemplating the acquisition of some new PCs, do as you might not normally do. And look into Wyse.

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ADVANCED TECHNOLOGY

TECH TALK

Boise voice test

■ About 25 US West employees began testing the first phase of a unique voice recognition system called Voice Interactive Phone (VIP) in Boise, Idaho, last week. VIP will allow users to access most of their optional telephone services by simply dialing one code and then verbally requesting the service they wish to turn on or off. The test will be expanded this fall to about 192 homes in Boise. US West Communications, AT&T Network Systems and Bell Laboratories are collaborating on the new system.

Lifelike computer talk

■ The latest word in computer talk is new software called Sound Bytes that makes synthesized speech more lifelike. San Diego-based Emerson & Stern Associates, Inc. said last week the new software has an ability to parse that gives synthesized speech a natural rhythm that includes pitch variations, word stress patterns and punctuation. Other products synthesize one word at a time and produce a sentence by stringing words together, generally with flat intonations and with smooth transition between sounds.

Compression vision quest

■ Integrated Information Technology, Inc. in Santa Clara, Calif., has introduced a programmable video compression processor that handles multiple still-image and full-motion video standards on a single device. The company declared that its new Vision Processor is the first to work with a multiple of compression standards and can be easily reprogrammed to support other standards as they emerge. Vision Processor is already being used in a new video teleconferencing system called Rembrandt II/VP marketed by Compression Labs, Inc. in San Jose, Calif. Other applications for the processor include multimedia, digital camcorders and color laser printers, the company said.

Tierra adds to evolutionary studies

A computerized world created on an IBM PC could have real-world benefits for scientists

BY MICHAEL ALEXANDER
CW STAFF

Thomas Ray, a biologist at the University of Delaware, has done something mere mortals never get a chance to do: He has created a world and filled it with creatures that evolve, interact, steal and, when the world becomes too crowded, kill the oldest creatures.

Ray, who makes no claim to being godlike, created his world, which he calls Tierra, on a virtual computer. The creatures he gave life to are electronic "organisms."

Tierra, which is the Spanish word for earth, is a computerized world that offers biologists a glimpse into ecological and evolutionary processes and allows them to test theories that would otherwise be impossible.

"I wanted to capture the essence of the life process in an artificial system," Ray explained. "To me, that is self-replication combined with evolution. If you can get those two features, then conceivably evolution can take it from there once you get it started."

Joel Nakamura

Ray, who became a computer expert to develop his program, said his work may also help computer scientists learn how to write more efficient code and make it easier to develop programs for a class of massively parallel computers called multiple instruction, multiple data (MIMD) machines.

Ray's first "organism," actually an 80-instruction code program, was turned loose in Tierra last year and immediately began behaving in clever but unexpected ways. The creature began to replicate, spawning offspring that were able to compete with each other and give life to their own offspring. Among the first creatures to evolve in an area of computer memory that Ray calls the "soup" were mutants that live and replicate by stealing bits of code from their predecessors. As the memory nears being filled with organisms, a "reaper" begins killing off the oldest to make more room.

The world is displayed on a computer screen as horizontal bars of red, yellow and blue that represent different kinds of organisms. The bars change in color and length, spawn different forms of parasites as the creatures evolve and finally create organisms that are parasite-resistant.

The program runs on a virtual computer, using only 60K bytes of memory inside an ordinary IBM Personal Computer clone. Ray developed his own language to create his self-replicating organisms using a set of only 32 instructions to control his artificial life support system.

Tierra has unearthed some surprising results that may have real-world benefits for computer scientists, Ray said.

"The first is, it is able to optimize code," he said. "One example is that I put in an 80-instruction code program one night, and by the next morning, it had optimized to 22 instructions and could reproduce 6 times as fast in CPU cycles."

Life in Tierra may also give programmers a better understanding of how to program MIMD parallel processing machines. MIMD machines break a program into several parts that run concurrently on separate processors. In comparison, single instruction, multiple data machines spread the problem among parallel processors and then simultaneously process it, a single instruction at a time.

Some of the techniques used in Tierra's virtual computer world are similar to those used in MIMD machines. "Evolution could be a guide to showing how to use good programming techniques," he added.

Taking five top technologies into the future

BY MICHAEL ALEXANDER
CW STAFF

What are the top five emerging technologies that will shape the corporations of the 1990s? According to Andersen Consulting, they are multimedia and the human computer interface; cooperative processing; telecommunications; object-oriented development; and computer-aided software engineering (CASE).

The consulting firm has released a new report called *Trends in Information Technology: The Challenge of Business Integration*. It predicts what the business world will look like five years hence and the technologies that will shape it.

The richest interfaces now under development use multimedia — a mix of text, images, graphics, voice and other media — to help users relate to computers, said W. James Fischer, managing partner at Andersen Consulting who heads the Technology Services Group that authored the report. Voice recognition and voice synthesis will be the most radical additions to the interface and eye tracking; touch-screen and pen-based computing will provide alternatives to entering information, the report noted.

The next age of computing will be the most person-oriented of all because of the emergence of cooperative or client/server processing.

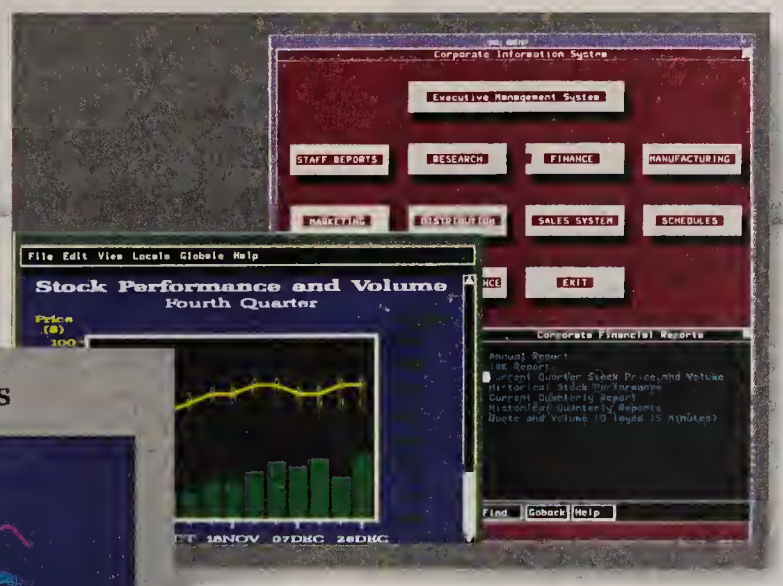
Cooperative processing more closely mimics the nonlinear, sometimes unpredictable, way in which humans work. The technology also strips away the complexity of navigating the systems technology, and it allows the user to find answers to business problems — the real reason for using information technology in the first place, the report's authors said.

Global competition will place more demands than ever on a company's telecommunications networks, Fischer said. Increased capacities and wider geographics coverage will be essential to corporate growth, and that, in turn, will make it possible for network providers to offer a wider range of cost-effective services and solutions, Fischer explained.

"How are we going to build all of these things?" Fischer asked. "Object-oriented development will be the breakthrough, and CASE will be the enabler. The fact that the technology is ripe, and the business environment is ripe — that is why we put them on our list."

The report is based on interviews with 15 Andersen Consulting clients that have successfully re-engineered their business components and interviews with more than 60 of the firm's partners.

Executive



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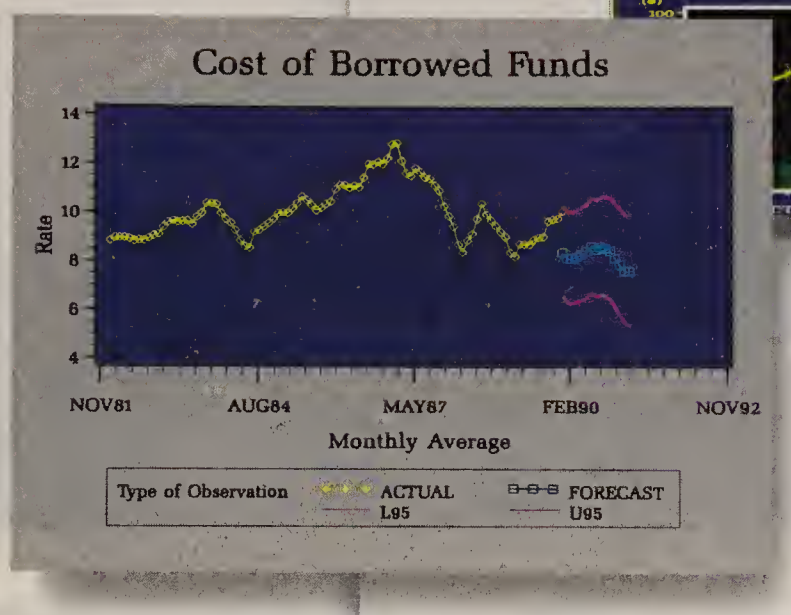

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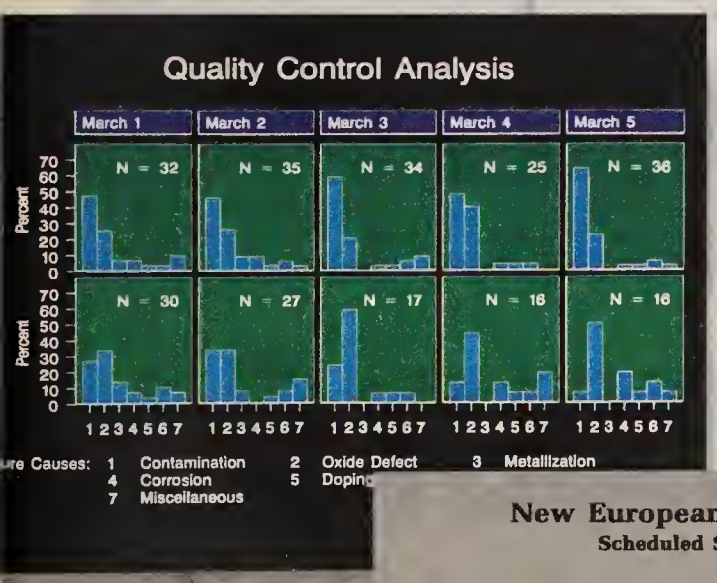
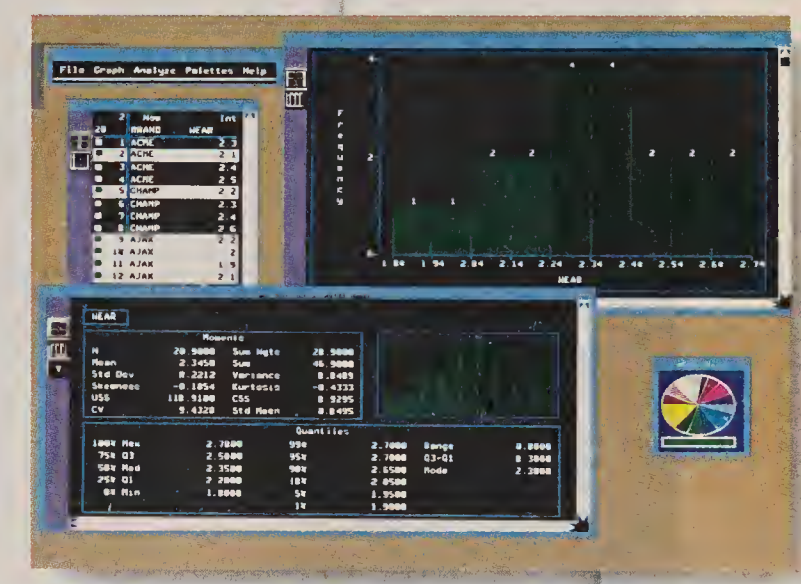


Research and Development



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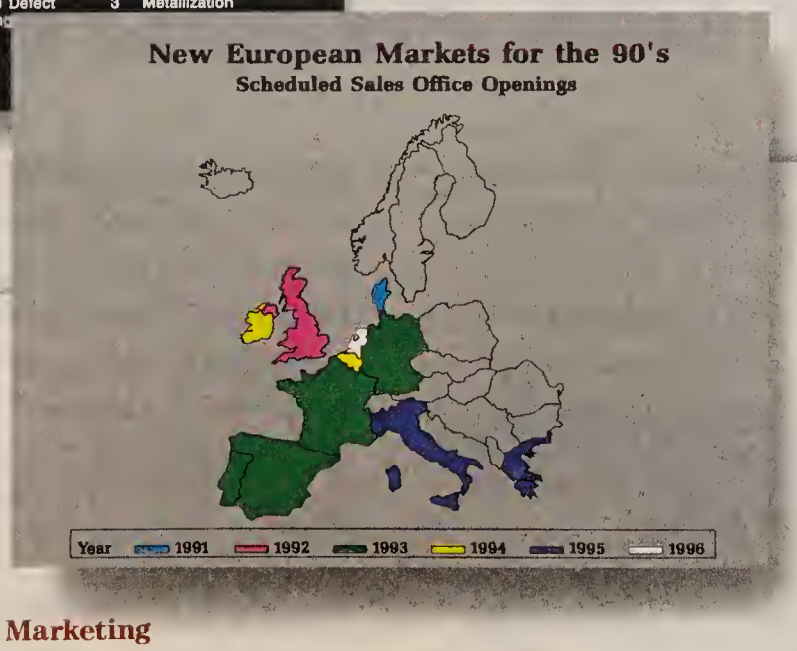

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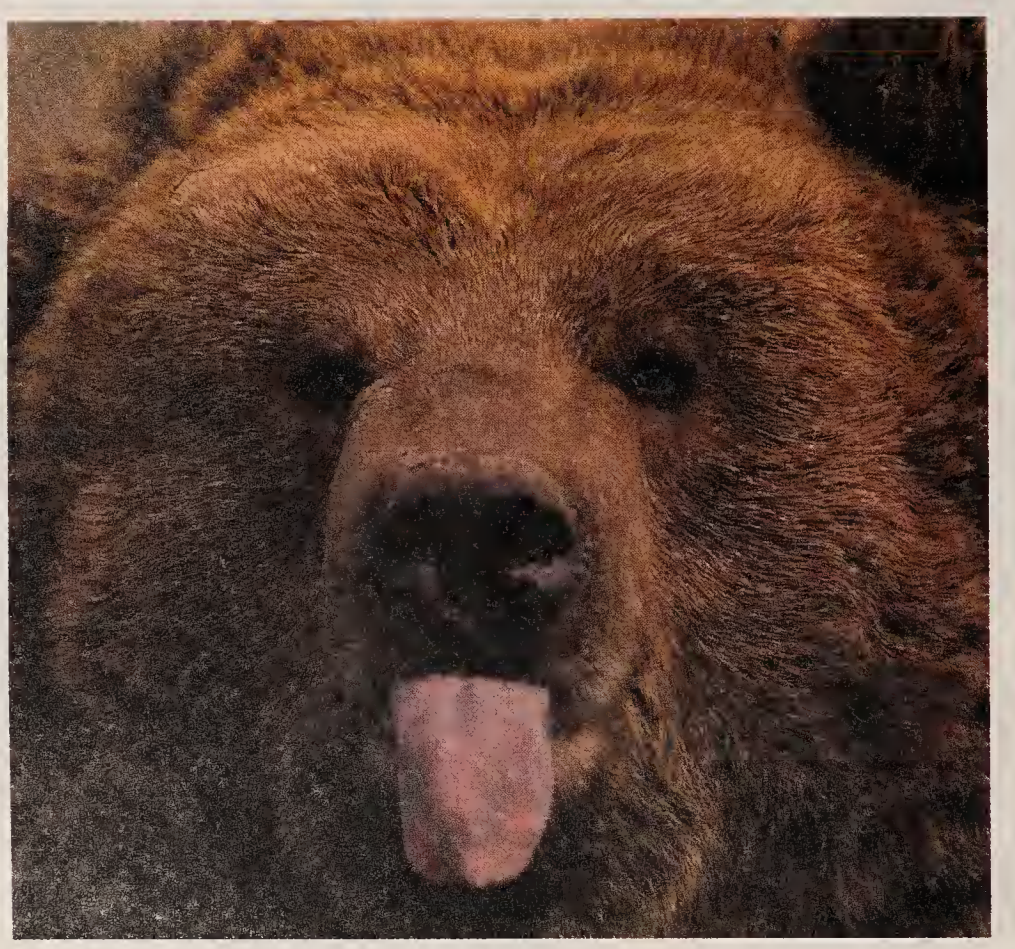

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EDITORIAL

Premier users

If you're like most people, you book your business air travel by selecting the destinations, choosing some approximate departure and arrival times and letting the office assistant do the booking, usually in coach. Thus, you end up flying on Air Whatever.

But suppose this happened: While standing in line to board your Acme Airline flight, an attendant asks you step to the front of the line and hands you a boarding pass for a first-class seat. Why? Because, they say, you're a valued customer who has flown Acme three times in the last six months, and the airline just wants to say thanks.

The real reason is that after a quick systems check, Acme knew it had space in first class on that flight, and it knew you were a frequent coach flyer, not only on Acme but on other airlines as well. The cost to Acme for this largesse was minimal — the seat was there anyway, and how much extra can a first-class meal cost?

And the payback? You can bet your boots that the next time you book a flight, the first thing you'll say to the office assistant is, 'Try hard to get me on Acme.'

IS can make this happen so easily, giving Acme at least a temporary competitive advantage. As is becoming increasingly clear, all competitive advantages are fleeting.

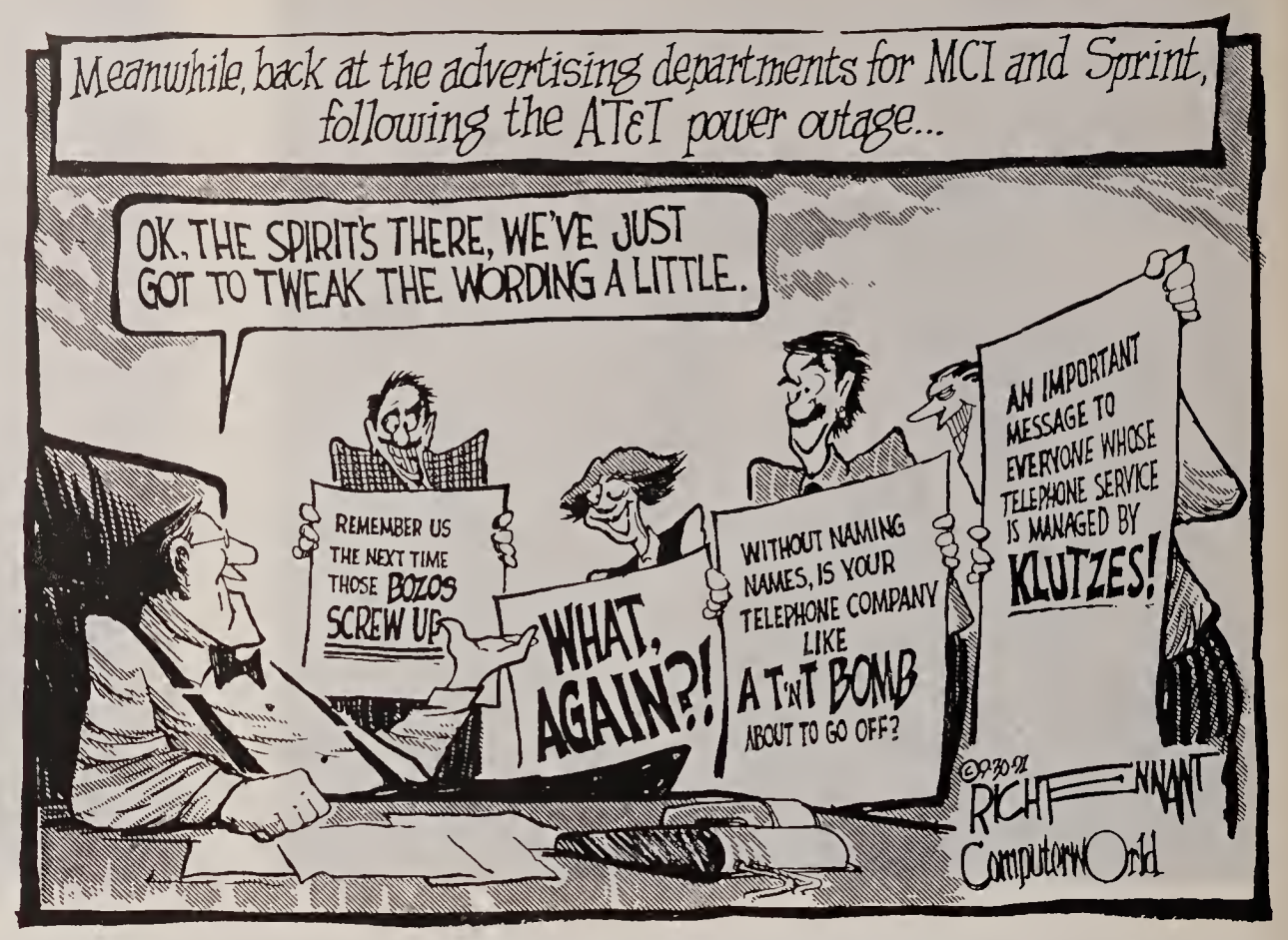
So why doesn't this happen? Why, with the tremendous wealth of information held by banks, are there so few innovative customer services offered by commercial banks? In other words, why are so many data-rich companies unable to mine that data to produce the mother lode of customer benefits that would truly distinguish Company A from Company B?

It certainly hasn't been through any lack of spending. By most estimates, U.S. corporations will spend more than $200 billion this year on information technology. The percent of capital spending consumed by information technology outlays has more than doubled in the past 10 years.

A clue to this dilemma of underachievement can be found in today's fourth annual *Computerworld Premier 100*, in which Michael Hammer writes, "Being a user of leading-edge technology is not the same as being a leading-edge user of technology . . . Advantage is achieved only by having the right business strategy . . . and ensuring that all aspects of the organization are designed with these processes in mind."

In our airline example, systems have been built largely to ensure that seats get filled and planes get tracked and maintained. That is core to the business strategy. But customer service for most airlines translates into flashy claims of on-time arrivals, which usually is a product of things the airlines don't control, such as weather and flight controllers.

In short, the next domain of competitive advantage, that of customer service and product customization, has been breached by very few companies, many of which are featured in our special issue today. Collectively, these companies are sending out a very compelling message.



LETTERS TO THE EDITOR

No S. Africa ties

I am writing in regard to the article "U.S. firms leery of South Africa" [CW, Aug. 12].

In the chart accompanying the article, Sun Microsystems, Inc., is shown as having a distribution agreement with a South African firm.

We wish to place on record that this is entirely untrue. Sun Microsystems does not do business in or with the Republic of South Africa, nor has it appointed any third party to act as its distributor there.

Roderick A. Steedman
Deputy general counsel
Sun Microsystems, Inc.
Mountain View, Calif.

Licensing won't prevent fraud

I am writing in response to the letter from Bruce K. Brickman [CW, Sept. 16] regarding "N.J. licensing proposal draws user opposition" [CW, Aug. 19].

There are many problems with this bill, which seeks to license "software designers." I use quotes since the bill goes on to target those who design, specify, implement, test, validate, operate, maintain and manage software. Does that strike you as overly broad?

A difficult task would be the creation of the test required to show that developers meet "certain minimum standards." Having designed and written the software for many computer-based employment selection tests, I can tell you that the chance for significant adverse impact on minorities, as well as the chance of testing something that is simply not required for the job, is very great.

We currently have the world's best software industry. The concerns voiced by State Assemblywoman Barbara F. Kalik about problems with software developers are real and are a cause of concern for all of us in the industry. However, this bill is not the solution.

The specific problem that Mr. Brickman talks about (fraud by a software developer) would not be solved by this bill.

Like any industry, software development attracts the good and the bad. If I bid on a project, the customer can do a check of references and see samples of previous work.

If I contract to do a job and either do not do it or do it improperly, the customer has the right to sue for breach of contract.

I have never in the seven years I have been in the industry had a customer ask me about certification. No business spends money and time on things that customers do not care about.

Douglas J. Reilly
President
Access Microsystems, Inc.
Brick, N.J.

Tax tangles

I would like to respond to "Pound foolish" [CW, Aug. 19].

As the publisher of the "Software Taxation Letter," I follow all aspects of software taxation. Rarely have I seen the computer press react with such half-truths and misinformation about Pennsylvania's recent decision to tax computer software and services.

First, there is nothing unique about this. At least 12 states tax custom software, and 14 states tax programming services. Second, those states that exempt custom software and programming services from taxation normally have stringent definitions. For example, most states define custom software as software created for use by one customer only. If the developer merely combines units of preexisting code, it may not qualify.

Finally, as a general rule, if canned software is being customized for one user, the cost of the customization must exceed the cost of the unmodified software, or the entire cost (including the cost of customization) is taxable.

Even if the state taxes canned software, you can avoid taxation in at least 12 of them by changing the mode of delivery or by adding one or two lines to your license agreement.

Finally and most importantly, you have ignored the requirement of interstate commerce and nexus. Just because a customer purchases services and/or goods from an out-of-state supplier does not mean that no tax is due. The in-state consumer is under a legal obligation to collect and remit the use tax. In some states, the use tax can be greater than the sales tax.

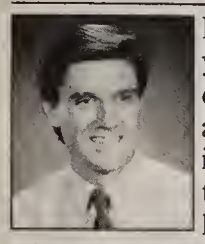
L. J. Kutten
President
Kutish Publications, Inc.
Wayne, Pa.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

DEC should be 'open' to freedom of choice

Lawsuits suppressing third-party products rob customers of right to shop freely for price, service

JEFF DEWALD



For a while this year, you could close your eyes and almost imagine you were in the 1960s. Hardly a week passed without the trade press heralding the latest development in "openness."

All of this seemed unusually good-natured for an industry known for its competitiveness, but I was willing, even anxious, to suspend cynicism and believe that a new age might well be dawning. Heck, I was even thinking about letting my hair grow a bit.

Sadly, the purity of the movement's original intentions was quickly overcome by concerns about proprietary technology and patent infringement. A ban on the use of hierarchical storage controller (HSC) and standard disk interface/standard tape interface (SDI/STI) technology was implemented by one of the loudest supporters of this hoopla about openness — Digital Equipment Corp.

What happened to the guarantees of openness that had seemed to signal a shift in the way bus architectures could be handled?

Timothy Carroll

It's no secret that DEC has had trouble competing with the smaller and fiercely determined third-party storage system vendors.

Spearheading DEC's efforts to drive these vendors out of the HSC, SDI/STI product lines is a flurry of lawsuits alleging patent infringement. Under the threat of costly and protracted lawsuits, a number of the third-party suppliers have already opted to sign phaseout agreements that stipulate not only elimination of infringing products, but recognition of DEC's patent rights and restitution to DEC for the illicit use of its technology.

Jumping the gun

Interestingly enough, DEC is marketing the phaseout agreement before a decision has been reached in the courts. This may mean one of two things: Either DEC is offering a solid means by which to avoid a lawsuit, or it is hoping to obtain agreements from as many vendors before settling out of court with Emulex, Micro Technology, Inc. and others.

By redoubling its legal efforts to suppress third-party products, DEC is trying to deprive its customers of the right to choose alternative products that are, in many cases, faster and better than its own.

Currently, DEC is attempting to outbid third-party manufacturers by slashing prices on storage and disk drive products. According to a newly released price list, the company has cut its prices on some disk drive units by 35%. These reductions will be welcome news to the DEC customer in the short term, but if DEC succeeds with its legal initiatives, there is no guarantee that its pricing structure won't change just as radically in the opposite direction.

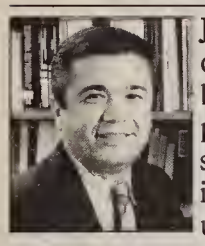
Both pricing and service are issues that should be in the front of every VAX manager's mind at this point.

Proprietary technology or not, the ability to shop freely for price, service and added features is a valuable right for end users. Unless a vendor is willing to accord its customers that kind of freedom, there is very little reason to believe it is serious about "openness."

Dewald is editorial director of the Digital Dealers Association, which represents both the secondary market and third-party vendors.

Moving overseas to duck tariffs is un-American

ZVI YANIV



Japanese producers have been selling flat-panel computer screens — very important products technologically and economically — in this country for a fraction of what it costs to manufacture them. They call this "forward pricing," a practice of pricing today against future lower production costs. The U.S. Trade Law, however, calls it "dumping" and requires counterbalancing import tariffs.

When the International Trade Commission (ITC) imposed tariffs last month, U.S. computer makers reacted predictably. If they couldn't keep buying Japanese displays at a fraction of cost, they threatened to start making their notebook and laptop computers overseas. The ITC's tariffs don't apply to flat-panel displays coming into this country as components of finished products.

This shortsighted U.S. response involves risk. It could even prove suicidal. Ask yourself, why were savvy Japanese businessmen selling their products here well below cost. Why were they willing to face years of red ink? If you can't already see the ominous picture taking shape, let me tell you why.

Reason No. 1: Cutthroat pricing can put an early end to competition in a marketplace that is forecast to reach $20 billion to $40 billion annually when you include display screens for computers, high-definition televisions, video games and other devices that will use picture-thin flat panels instead of bulbous CRTs.

Reason No. 2: The flat-panel display is really a huge integrated circuit. Once you learn how to build this complex device, you can add circuitry on the display's periphery that lets you create a notebook computer, a CAD/CAM workstation, an HDTV or any other visual device.

If only one country is the master of flat-panel manufacturing technology, it can control the development, availability and pricing of entire classes of future electronic information products. So much for competition of any kind!

The Government Accounting Office reports that Japanese manufacturers may already be denying their U.S. customers access to the latest flat-panel technology. And now, in the wake of the ITC's tariff decisions, Toshiba has announced it will immediately move assembly of its most advanced active matrix computers from California back to Japan, and Hosiden has declared it will ship no more flat-panel screens to its U.S. customers.

The big squeeze play has begun!

I challenge U.S. computer companies to act in their own self-interest. They can safeguard their futures by helping to build a flat-panel manufacturing base here at home. Or, by refusing, they can risk becoming mere peddlers for Japanese manufacturers who will dictate who gets which products, under what conditions and at what prices.

It is true that when U.S. computer makers first contracted with Japanese producers, the U.S. had no volume manufacturing capacity for flat-panel displays. But neither did the Japanese. U.S. companies provided millions of dollars to build a manufacturing base there.

Before this happened, my company negotiated with IBM, Apple, Compaq and others. One company's engineers even warned their management that U.S. technology was superior. Why then did they go to Japan? I can think of three reasons: The lure of artificially inexpensive prices (now diminished by tariffs), the supposed security of partnering with big companies (now brought into question by production difficulties), and the failure to understand the power they would be handing over (Japanese companies now admit they intend to put their best display technology into their own products).

For lack of investment and purchase orders, the U.S. flat-panel industry remains small and struggling. Mine is the only U.S. company now producing the kind of active matrix LCDs the Japanese are currently focusing their efforts on. In order to command this vital technology, Japan is out-investing the U.S. a thousand-to-one.

The fact is, however, that U.S. displays are equal to or better than Japanese displays in performance and can match them in volume pricing.

I admire the Japanese for being so farsighted and determined. U.S. businesspeople must become equally so.

U.S. companies that use flat-panel displays must now decide whether it is time for them to look ahead and act to stay in control. They can do so by helping to build a viable manufacturing base in this country for the display screens all of us will be using in just a few years.

Yaniv is president and chief executive officer of flat-panel display maker Optical Imaging Systems in Troy, Mich.

Insight: Yugoslavia

Milos Milacic, 24, recently transferred from Belgrade University in his native Yugoslavia to an undergraduate electrical engineering program at Michigan Technical University in Houghton, Mich. What follows are his comments on how technical education works in his country and how it differs from what he has observed in the U.S. (Milacic is one of several international students who were interviewed for Computerworld's 1991 "Computer Careers" *campus edition, which will be published at the end of next month.)*

"We don't have electives in Yugoslavia. There are quite a few humanities courses in the program, however. We have languages and philosophy, including the philosophy of war: the reasons war is waged, how to prevent it and things like that.

"In Yugoslavia, higher education is sponsored by the state. Very often, students there have to study from many books — this chapter from this book and that chapter from that book. Or we have to study from notes because the book doesn't exist. It's difficult to study when you go to the library and there are only four copies of a book that 400 students need.

"I think students at American universities study much less than students in Yugoslavia but have better opportunities. What I like about the U.S. is that everybody is measured by his work, not by his ideological thinking — whether he is a good communist or bad communist or good democrat or bad democrat. In the U.S., nobody asks anybody which party he is a member of or anything of that nature."

Introducing two with some of the numbers in

If it sometimes seems that workstation vendors talk too much about specs, maybe it's because they have so little else to talk about.

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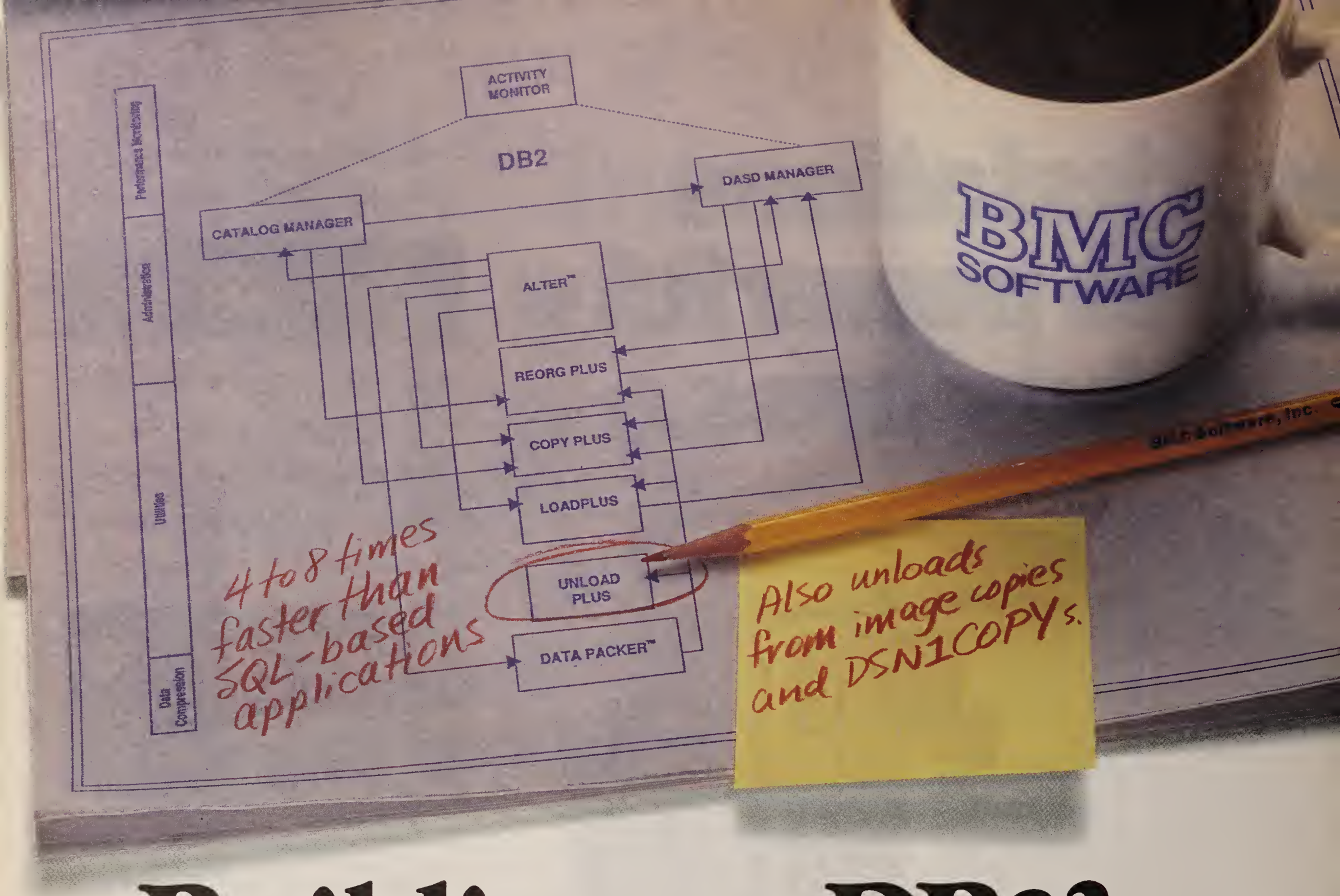

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NEW DEALS

Convex signs deal in Finland

Convex Computer Corp. sold two minisupercomputers to the Ministry of Education and the Ministry of Finance in Finland. The Convex Models C3840 and C220 will be installed at the Centre for Scientific Computing near Helsinki, Finland. The center provides supercomputer and general-purpose computer services to Finland's technical, scientific and industrial communities.

Structural Dynamics Research Corp. will receive approximately $1 million from a number of recent orders from Lockheed Corp. Lockheed will use the design and engineering software at several sites for design and analysis of satellite and missile systems.

MCI Communications Corp. signed a purchase agreement for high-end storage devices from Hitachi Data Systems Corp. MCI will install the Hitachi 7390 disk drives in five U.S. data centers over the next nine months.

Ford Motor Co.'s Electrical and Fuel Handling Division licensed Fourth Shift Corp.'s manufacturing and accounting software. Ford will install the software in a new plant near Budapest.

IBM multimedia to take shape

BY MICHAEL FITZGERALD
CW STAFF

IBM is planning an October announcement that it hopes will transform multimedia from a quirky, arcane personal computer technology into an enterprisewide resource.

IBM officials would not give specifics on products slated to be announced Oct. 17. However, sources at the firm said enhanced versions of current IBM multimedia offerings would dominate the list, and IBM would begin to clarify the role of the mainframe in multimedia. They include a new version of the Action Media digital video interactive card that will run twice as fast and retail for less than $1,500, as opposed to $2,495 today.

IBM's Peter Blakeney, manager of market programs, multimedia and education, acknowledged that IBM was readying a new multimedia push, though he did not confirm details. He did say "it will be a very strong statement of the direction we're going — we'll begin to integrate multimedia capabilities and you'll start seeing the emergence of non-Personal System/2 multimedia products."

While IBM said it expects to see full-motion video/audio multimedia applications drive demand for systems ranging from its Enterprise System/9000 mainframes to souped-up versions of its PS/1, Blakeney noted that IBM does not see the huge memory needs of applications with video and audio capabilities as driving hardware sales.

"Our intent is . . . not to push iron, but to determine what a customer's requirement is," Blakeney said. He added that IBM has been "trying to get away from" an image as a big-iron pusher since 1987. "I have a hard time articulating how multimedia is going to drive more mainframe sales when I don't know what a customer's problem is."

Still, multimedia is a key piece of IBM's long-term strategic plans, and most analysts contacted said IBM is looking to the spread of multimedia applications to keep mainframes installed at current sites that might otherwise downsize.

Continued on page 32

High prices, anxiety stalling CASE market

BY KIM S. NASH
CW STAFF

New evidence shows that growth in worldwide sales in the CASE market has slowed considerably this year, down to 26% for 1991 compared with the 1990 rate of 32%, according to one analyst's calculations.

Another analyst put projected sales growth at 34% in 1991 vs. 38% in 1990.

The numbers may not be identical, but the message is clear: Users are not snatching up computer-aided software engineering (CASE) tools as quickly this year as they have in years past.

Recession-slimmed information systems budgets have hampered spending, but price is not the only concern. Confusion rules the CASE sector, consultants said.

"This year, we've seen a lot of 'Too soon to tell' when we asked users to identify the biggest benefit they've seen from their CASE tools," said Jay Prakash, president of consulting firm Strategic Focus in Milpitas, Calif.

Overall, worldwide sales for all U.S. CASE vendors topped $1 billion last year, an increase of just 30% in $787 million in 1989, according to market research firm International Data Corp. (IDC) in Framingham, Mass. Compare this with IDC's estimated 56% growth for 1989 vs. 1988.

Compatibility problems

A nagging problem for current and potential CASE users is the lack of interoperability between different vendors' tools, some analysts said.

To help cost-justify expensive products and get more mileage from the tools they do have, users want the output from one product to be readable as input for another, said Dave Sharon, president of CASE Associates in Oregon City, Ore.

Sharon said 1989 "was a great year for CASE vendors — sales hit the roof — but 1990 slowed considerably."

This is because many users discovered that the individual modules they bought from different vendors for separate parts of the software development process do not work together, he said.

Although CASE vendors are now starting to modify their products to work together, those changes will not materialize until next year, Sharon said.

In the meantime, 1991 buying plans are being deferred.

In a survey of 225 U.S. companies, IDC found that current CASE users devote more resources to maintaining existing applications than building new ones.

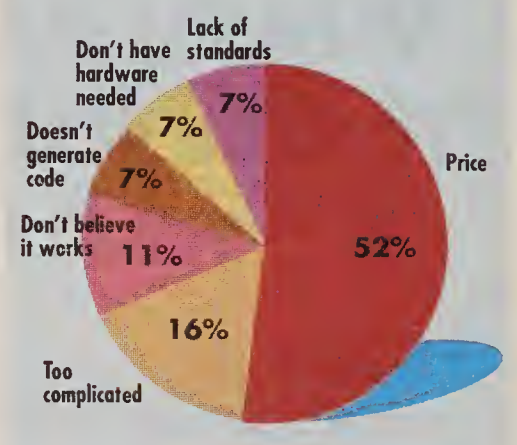
One reason for this might be that CASE is like the housing market right now, according to John Palmer, principal at New York consulting firm Atlantic Systems Guild, Inc.

Users say they are leery of undertaking new systems development projects in this economic climate, but they do have to maintain their existing applications.

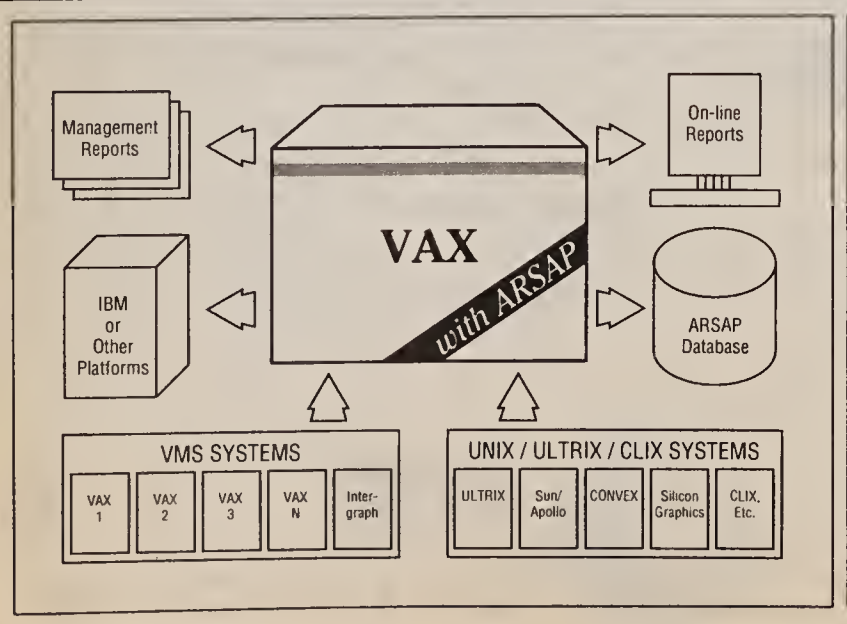
"If your roof leaks, you're going to do a little fix but put off building that expensive addition," he said.

Rejection complex

The top reason users say no to CASE is that the tools cost too much



Source: International Data Corp. CW Chart: Janell Genovese



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Texas agency lassos open systems plan

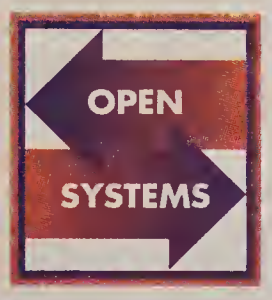
State department pursues four-step, 10-year program to promote scalability and portability

ON SITE

BY ELLIS BOOKER
CW STAFF

AUSTIN, Texas — The Longhorn State is riding the open systems trail, thanks to a 10-year computing plan for its 250 government agencies.

Spurred by complaints from state legislators that the $400 million to $500 million spent annually on information systems lacked the coordination of some long-range planning, the Texas Department of Information Resources (DIR) was set up two years ago.



According to DIR executive director Ann Fuelberg, her department received a mandate from the state to develop a strategic plan and to have each of the state's agencies develop their own plans.

Initial plan

DIR's first plan, issued last November, emphasized the need for adopting open systems, particularly the Open Systems Interconnect (OSI) networking standards. The plan also adopted the Government Open Systems Interconnect Profile and Applications Portability Profile created by the National Institute of Standards and Technology.

But such "interoperability" through OSI, which has been adopted by a number of states, does not go far enough, according to Jerry Johnson, standards analyst at DIR.

"OSI is fine," he said. "But what we really want is portability and, in the future, scalability."

To that end, the Texas DIR went even further this year, adopting the X/Open Portability Guide and Common Applications Environment models.

Four steps

DIR also developed a four-phase state IS migration plan, which it said it believes is the first of its kind in the nation.

- Phase 1 (1992-1993): Training and prototypes; commence work on a statewide network, which will consolidate the multiple agency networks on a common OSI-based backbone. Commence interagency electronic mail using the X.400 and X.500.
- Phase 2 (1994-1995): Migrate agencies already in a Unix environment to open systems; other agencies are required to submit migration plans.
- Phase 3 (1996-1998): Examine applications, looking for additional data and resource sharing among agencies.
- Phase 4 (1999-2001): Complete implementation.

"We're trying not to scare vendors or the agencies into believing things will happen overnight," Fuelberg stressed. With a staff of 116, Fuelberg's department provides support for the agencies, which have been generally receptive to the migration policy, she said.

But DIR also uses the power of the purse to back its strategy. It reviews the IS procurement plans of each agency and can disapprove a plan that fails to anticipate an open systems move.

Taking first steps

Representative of the open computing direction of Texas' state agencies is a recent project at the Texas Rehabilitation Commission (TRC).

In September, the commission became one of the first state agencies in Texas to act on the open systems initiative, awarding a $400,000 contract to systems integrator Applied Information Sciences, Inc. (AIS) in Landover, Md., to develop the client/server/mainframe application.

"Last June, we made the decision to go to open systems, so we're 18 months into our five-year plan," explains John Ribble, assistant deputy commissioner for IS at the TRC.

The pilot, which will begin after the first of the year and run for six months, is geared toward developing an automated disability examiner workstation that will expedite the movement of the 15,000 or so claims processed by the Texas agency annually.

In the pilot configuration, Intel Corp. 80386-class personal computers will be attached on a Novell, Inc. local-area network and interfaced with two Unisys Corp. U 6000/65 Unix servers. The servers, in turn, will be linked to the commission's two Unisys V series mainframes.

AIS will use its Uniaccess system for connecting the client/server environment with the servers, which will run Unisys' Open/OLTP software, a transaction management system based on Unix Software Laboratories' Tuxedo Transaction Manager. If the test is a success, the ultimate configuration will involve some 500 PCs and more than 40 Unix servers, Ribble said.

Ribble said he expects to issue a request for quotes from hardware vendors next July.

ELLIS BOOKER

IBM exec squelches AS/400, RISC rumors

BY MARYFRAN JOHNSON
CW STAFF

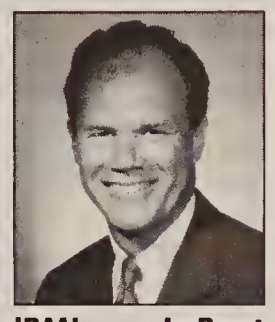
Nothing breeds rumors like success.

Or so it seems for IBM's Application System/400, the most lucrative proprietary midrange line on the market these days. Not only is the machine pulling in $14 billion in annual sales, or 20% of IBM's total revenue, it is also generating intriguing rumors about its future.

- Rumor No. 1: A dramatic change is in the offing for the central processor engine. The story goes that by 1993, IBM will toss aside the current chip set at the heart of the machine for a reduced instruction set computing (RISC)-based CPU, much like the one in the Unix-based RISC System/6000.
- Rumor No. 2: With the AS/400 and RS/6000 product lines recently moved into a direct reporting line to IBM President Jack Kuehler, greater resource sharing or combined research and development operations are expected between these competitive product lines.
- Rumor No. 3: IBM is seriously considering a plan to let the AS/400 developers in Rochester, Minn., take over the commercial pieces of the Unix/AIX operating system work under way in the Austin, Texas-based RS/6000 laboratory.

Maybe, maybe not

"Not so fast" to all the above, said Robert LaBant, vice president and general manager of IBM's Application Business Systems, the unit in charge of the AS/400.



IBM's LaBant *downplays rumors*

"People are convinced we are going to RISC now and are going to announce it in 1992. We are not," LaBant said.

The Kuehler connection is being overblown by observers, he added, and the notion of moving commercial Unix development to the AS/400 group is simply wrong.

One of his "strategic imperatives" for the AS/400, LaBant said, is keeping the applications path uncluttered — however the machine evolves.

With more than 9,000 software packages available now, it is crucial to maintain applications compatibility into the next generation, he said.

As for a RISC engine in the AS/400, the IBM executive said there is enough sophisticated CMOS technology available to propel the machine "into the 1996 time frame" before it runs out of gas.

"We do not need RISC to carry us through the first half of the 1990s," LaBant stressed.

One distinct possibility, however, is the near-term addition of a RISC coprocessor for numerically intensive computing requirements. Yet IBM finds few AS/400 customers in an uproar about heavy-duty number-crunching. Those that are tend to buy an RS/6000 instead.

One commercial customer that chose an RS/6000 over an AS/400 was Celtic Life Insurance Co. in Chicago. The decision swung upon the lower cost and the speed with which the RS/6000 could run an insurance claims application, said Steve Despain, a programmer in the information systems department.

Souping up the price/performance of the AS/400 and averting such competitive losses to Unix machines are key concerns for LaBant and the Rochester lab. Yet, some analysts cautioned that competing in the raw price/performance arena could prove disastrous for the AS/400. "That would be trying to market the machine on its biggest weakness," said Peter Burris, an analyst at International Data Corp. in Framingham, Mass. "Its greatest strength is its robust, integrated nature.

"IBM is not going to sacrifice the competence of the AS/400 just to use some groovy RISC chip," Burris added. "They'll use whatever set of hardware technologies make the AS/400 the best commercial machine on the market."

On the recent shift of the RS/6000 and AS/400 product lines under Kuehler, LaBant said analysts are misreading the purpose of that move.

"What we're trying to do is increase the ability for both of these lines of business to operate as a quicker-to-market, more flexible unit," he explained.

SOFTWARE SHORTS

Unicode to release specs

The Unicode, Inc. consortium said recently that it is making available a prepublication copy of its coding standard to help computers speak many national languages. Unicode, formed last February, is also working with other groups, including the International Organization for Standardization, to help promote acceptance of the standard [CW, Feb. 25]. Hard-bound copies of the Unicode specifications should be available in bookstores by mid-October. Also, new vendors have joined the 18-member consortium, including Digital Equipment Corp. Existing members include Apple Computer, Inc., IBM, Xerox Corp. and Microsoft Corp., a Unicode spokesman said.

Dun & Bradstreet Software and **Hewlett-Packard Co.** recently announced that D&B Software will migrate its logistics software applications to the HP 3000 MPE/XL reduced instruction set computing platform. Designed for the manufacturing environment, the logistics software includes demand forecasting and distribution resource planning systems. It will be integrated into the current AMAPS MRP II Order Management and production scheduling systems from D&B Software. Both companies said they anticipate the migration to be completed in mid-1992.

Welsh Water flows to new systems

ON SITE

BY SALLY CUSACK
CW STAFF

BRECON, Wales — "Heb Ddwr, Heb Ddim — without water, there is nothing."

This is the credo of Welsh Water PLC, which is responsible for delivering clean water to 3 million people in Wales each and every day.

To accomplish this, the water utility depends on a variety of hardware and software products. This includes an ICL mainframe, Data General Corp. MV minicomputers, DG Aviion servers and Ask Computer Systems, Inc. Ingres database software.

The company, like most business entities, recently re-evaluated the technology landscape and opted to move toward an open systems environment.

Nigel Stanton, business development manager at Welsh Water, said the company has developed a strategy that maintains the existing information technology investment while utilizing certain areas of open systems products and standards.

The key issue in developing a transition path was to protect existing information technology investments, Stanton said.

The firm still relies on the proprietary DG MV/AOS/VS machines for maintaining a data preparation system and a laboratory system. It also runs DG's CEO office automation package in the MV environment.

Unix standardization

After deciding to standardize new applications on Unix platforms, the utility elected to install several DG Aviion systems. There is now a 6200 central server at the data center and 13 4000-class servers in the field.

The Aviions were chosen to run Welsh Water's new in-house-developed capital planning software.

"The effective planning of high-cost, long-term investment programs represents the greatest challenge facing water companies," said David Jeffrey, managing director at Welsh Water.

The software, which has an Ingres back end, went into production last April. Residing on the Aviion servers, it can be accessed by users on personal computer local-area networks located at the divisional offices.

"We drew up our technical criteria and evaluated many products on the market," Stanton said, adding that the company is happy with the technical fit of the Aviion — its performance as well as its binary compatibility in order to accommodate upgrade paths.

The Aviions perform dual roles, as both front-end systems and file servers.

The utility company has also provided a common user access for all systems using Microsoft Corp. Windows 3.0 and several terminal emulation tools from local companies.

"The Windows technology gives people a window into any application, including those on the MVs, the Aviions or the mainframe," Stanton said.

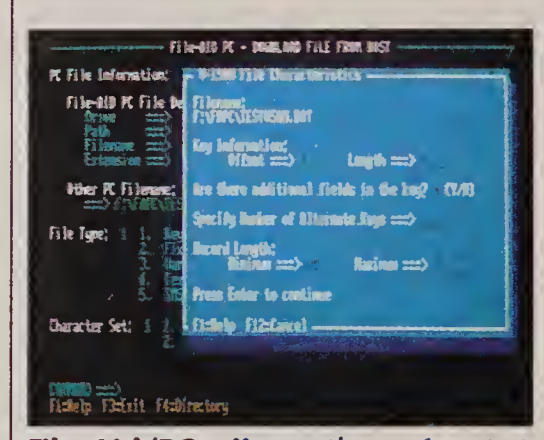
There are still several other major projects on the drawing board as Welsh Water moves its computing environment into the 1990s. These include a fourth-generation development environment using both Ingres and computer-aided software engineering tools and the development of an extensive geographic information system.

"We are looking to deliver all of this within the next 10 years," Stanton said, adding that the "competitive element of open systems will ensure better value for our money."

File-Aid/PC to ease application tests

BY CHRISTOPHER LINDQUIST
CW STAFF

Compuware Corp. has announced a product it claims will help developers who need to move mainframe data to personal computer development platforms for testing.



File-Aid/PC *offers options when testing data on PC platforms*

File-Aid/PC is the Farmington Hills, Mich.-based firm's PC version of its File-Aid and Xpert products, which are currently installed at more than 3,000 IBM mainframe sites. It is intended to ease the transfer of mainframe test data to PCs for use by the Micro Focus, Inc. Cobol/2 Workbench and Stingray Software Co. IMSVS86 development environments.

"I think they're going to find a very receptive audience," said Andy Mahon, senior analyst of advance software development at New Science Associates, Inc. in Southport, Conn. He added that companies in the mainframe development tool market need to be looking at PC-based development, and File-Aid/PC was an indication that Compuware is aware of that fact. "It's a strategic necessity," Mahon said.

Developers transfer data using File-Aid/PC with File-Aid/Hostmanager and mainframe File-Aid or Xpert. Sequential, VSAM and IMS data are sent in a format that can be accessed by the Micro Focus and Stingray products. EBCDIC-to-ASCII conversion can also be performed during the transfer.

File-Aid/PC lets developers create, copy, browse, edit and print test data. Data can be analyzed and edited on a PC through the use of Cobol record layouts. Editing can be performed in either EBCDIC or ASCII formats.

Users of File-Aid for mainframes will reportedly find File-Aid/PC's interface consistent with the previous product. File-Aid/PC follows IBM's entry-level Common User Access interface guidelines.

System requirements for File-Aid/PC include an IBM-compatible 80286- or 80386-based PC running MS-DOS 3.3 or higher or OS/2 1.1 Extended Edition or higher. The Micro Focus Cobol/2 Workbench is also required. Stingray IMSVS86 is necessary if IMS is used.

The product is available now for a starting price of $10,000 for one File-Aid/Hostmanager host CPU license and 10 File-Aid/PC licenses.

IBM

FROM PAGE 29

"IBM doesn't do anything from a stand-alone point of view — they look to sell mainframe MIPS," said Evelyn S. Wilk, head of ESW, a Chicago-based consultancy specializing in desktop technologies.

"IBM's strategy is still concentric to the mainframe — but they won't say it," said John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H. He added that in terms of multimedia, IBM in the long term is "not looking to drive mainframe sales" but is pushing a strategic move into cooperative processing.

Blakeney does point to large mainframe users such as Sears, Roebuck and Co. as offering a peek at the way IBM thinks firms will use multimedia in the future. Sears' Merchandise Group has one application in which buyers working on networked PCs call images of clothes off of a compact disc/read-only memory player at the file server, and on the same screen pull purchasing data from Sears mainframes to decide what to order.

Still, Blakeney acknowledged that of some 3,000 IBM customers using multimedia in some form, only 50 to 100 go beyond stand-alone implementations.

Changing over

Some users are making this push now. Bethlehem Steel, which developed its first multimedia application six years ago, is beginning to create stand-alone multimedia applications designed to be networked in the future, as technology improves.

"If we believe a project will require future networking, where we download information to PCs, [digital video interactive] comes into play," said Leon A. Murphy, manager of Bethlehem's multimedia applications team. "I think in five years, we will be networking [multimedia applications]."

In the meantime, observers said multimedia is beginning to catch hold of the market.

"Companies seem to be saying, 'OK, now it's real,' " said Mark Bunzel, president of Avtex Research Corp., a Campbell, Calif.-based multimedia systems planning, integration and service company. "In the last four to five months, real applications and projects have started to surface."

NEW PRODUCTS — SOFTWARE

Utilities

Integral Systems, Inc. has released Infocus, a query and report tool for its mainframe human resources management software.

Infocus integrates data from Integral Systems' management modules, which include Payroll and Benefits, and can also draw data from multiple databases for single reports.

The product comes with a library of 25 standard reports, and custom reports are also possible.

Pricing for the software begins at $40,000, depending on modules selected, hardware and number of users.

Integral Systems
2185 N. California Blvd.
Walnut Creek, Calif. 94596
(415) 939-3900

Smartstar Corp. has introduced Smartreportpainter for Digital Equipment Corp. VAX/VMS systems.

The product is a report-writing utility with pull-down menus and a what-you-see-is-what-you-get painting mode. According to the company, it offers a look and feel similar to the Motif windowing environment.

Smartreportpainter's pricing ranges from $2,000 to $35,000, depending on hardware configuration.

Smartstar
120 Cremona Drive
Goleta, Calif. 93116
(805) 685-8000

System Support Products, Inc. has announced the availability of the Tape/36 utility for IBM System/36 midrange computers.

Tape/36 ($195) offers menu-driven control over tape functions, reducing the need for operation control language commands. It provides browsing and other capabilities through built-in operation codes.

System Support Products
7620 Arlen St.
Annandale, Va. 22003
(703) 642-8760

The Number Co. has announced the availability of VSAMSnitch, a data set management software package.

The product includes a flat-file program for use in managing VSAM data sets, plus two utilities that help identify poorly managed data sets. VSAMSnitch is distributed in source-code form.

Pricing for the basic package ranges from $125 to $275. Additional reporting modules are priced from $55 to $150.

The Number Co.
Suite 101
12007 Bobwhite Drive
Catharpin, Va. 22018
(703) 497-1400

Specialized Software International, Inc. has announced the availability of Tables Memory Manager (Tables/MM) for IBM's DB2 mainframe database management system.

Tables/MM is an optional element in the company's table management product line. It provides concurrent access to DB2 tables by CICS, IMS and batch regions. All tables support batch or on-line update utilities. The product significantly improves DB2 performance, according to the company.

Pricing ranges from approximately $15,000 to $30,000, depending on processor size.

Specialized Software
90 Madison St.
Worcester, Mass. 01608
(508) 753-0909

More products on page 34

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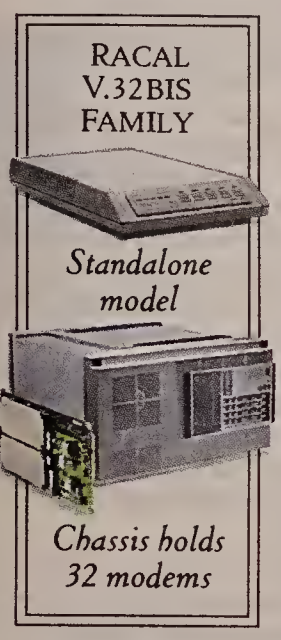

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Continued from page 32

Applications packages

Software Extraordinaire, Inc. has announced a new version of Suprback, its unattended backup software for the Wang Laboratories, Inc. VS computer.

Release 4.0 includes backup process lists, allowing administrators to omit selected files, libraries and volumes from the backup process. Wang wild characters are also supported, the firm said.

Suprback costs $3,900. It supports disks and a variety of tape media.

Software Extraordinaire
198 Lorelane Place
Key Largo, Fla. 33037
(305) 451-9204

Lawson Associates, Inc. has made its Lawson Accounting System available for the Hewlett-Packard Co. 9000 Series 800 systems.

The accounting system integrates General Ledger and several other modules. Pricing begins at $20,000 on the Series 800 platform.

Lawson Associates
1300 Godward St.
Minneapolis, Minn. 55413
(612) 379-0258

Development tools

Uniface Corp. has added a business graphics option to the Uniface Application Development tool set.

The module, Grafsman, allows users to display data from multiple databases in a graphical format within Uniface applications.

The Uniface fourth-generation language is available on Unix and VMS systems. The Grafsman option costs between $325 and $32,000, depending on hardware and number of users.

Uniface
Suite 140
1420 Harbor Bay Pkwy.
Alameda, Calif. 94501
(415) 748-6145

Hellenic Systems Ltd. has released the Embedded SQL Poet, a computer-aided software engineering tool with C/ESQL code generation.

The product helps tune relational database performance. It organizes C/ESQL code by table I/O operation into database subroutines, eliminating the need for embedded SQL statements, the company reported.

The Poet generates very high performance static SQL functions, and it also produces make files, tester fuctions and test-data generators, according to the company.

Embedded SQL Poet is currently available for Oracle Corp.'s database management software on DOS and VMS systems. Pricing ranges from $1,650 to $31,500.

Hellenic Systems
Suite 324
6400 Arlington Blvd.
Falls Church, Va. 22046
(703) 237-2424

Compilers

Acucobol, Inc. has ported its Acucobol-85 compiler to Stratus Computer, Inc.'s reduced instruction set computing system based on the Intel Corp. I860 chip.

The compiler includes a built-in source code debugger, a replaceable user file system and windowing capability, the company said.

It costs from $5,775 to $6,825 on the Stratus Intel I860 platform.

Acucobol
Suite 201
7950 Silverton Ave.
San Diego, Calif. 92126
(619) 689-7220

HARDWARE

Processors

Infotek Systems Corp. has announced memory upgrades for Hewlett-Packard Co.'s 9000 Series 425E and 382 models.

The boards are available with 8M bytes ($1,350) and 16M bytes ($2,750) of memory.

Infotek Systems
Suite 204
625 S. Lincoln
Steamboat Springs, Colo. 80487
(303) 879-1184

Dataram Corp. has introduced 4M-, 8M- and 16M-byte memory upgrades for Hewlett-Packard Co. 9000 Series 425E workstations.

Pricing for the DR-9425 ranges from $700 for the 4M-byte version to $2,800 for the 16M-byte board.

Dataram
Route 571
Princeton Road
W. Windsor Township, N.J. 08543
(609) 799-0071

Data storage

Ten X Technology, Inc. has announced OCU-110, its enhanced hardware caching interface software.

The improved software controls 256K bytes of random-access memory cache.

Subsystems are offered with a 650M-byte capacity in a 5¼-in. format to a 6.5G-byte capacity in a 12-in. write-once read-many optical drive format.

Pricing ranges from $4,495 to $29,500.

Ten X Technology
Suite 3200, Building 3
4807 Spicewood Springs Road
Austin, Texas 78759
(512) 346-8360

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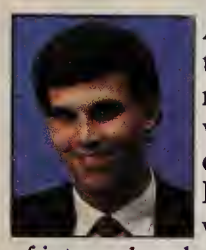
COMMENTARY

Michael Fitzgerald

From the rumor mill



Already in the loop. Rumors that IBM will develop its own version of Intel's 80386SX with 8K bytes of internal cache are behind the times. IBM already has it in a box and is pitching it to certain "price-sensitive" customers, according to a source at a competitor whose salespeople ran into the box being bid at an account.

Notebook power surge. Users waiting for a notebook computer with big biceps (i.e., with an I486 chip inside) will just have to keep waiting. One analyst says a company showed her a notebook running a 486 at Comdex/Fall '90. The expense of producing the machine in volume, as well as problems coping with the heat generated by the 486, have stopped this product from coming to market in 1991, though Compaq, Toshiba and Zenith Data Systems are said to be closing in on a marketable product, with Compaq's release slated for October 14.

Two sides to the coin. Microsoft Chairman Bill Gates, lately interviewed everywhere from *Fortune* to *Playboy*, told *Fortune* that IBM has not

Continued on page 40

Rivals seek Windows of opportunity

BY CAROL HILDEBRAND
CW STAFF

The imminent arrival of Wordperfect Corp.'s Windows-based package will add star power to the "Switch to Windows Word Processing" road show. The question is, how interested is the audience?

Analysts agree that the general move toward Windows gives competitors a better opportunity to shave a little off the estimated 70% market share currently held by Wordperfect's character-based product. The company's Windows-based package is expected to be announced in October.

The thinking is that users will be more amenable to switching products if they're moving into an entirely new environment than they would be if they were just making a normal upgrade.

However, a trackful of hurdles faces such would-be market filchers as Microsoft Corp.'s Word for Windows, Lotus Development Corp.'s Ami Pro 2.0 and Wordstar, Inc.'s Wordstar for Windows. At issue are such factors as file compatibility, technical support and upgrade costs — both for hardware and software, users and analysts said.

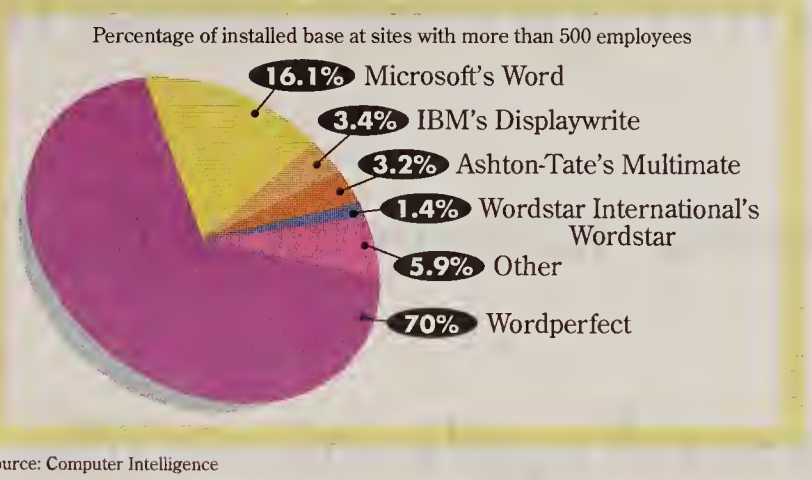
Users faced with the reality of coexisting with character-based and graphically based packages do not seem in any hurry to move it on over.

Vendors "are going to be selling both products for a long time, so it's more of a marketing thing than anything else," said Linda Deinberg, network manager at Fujisawa Pharmaceutical. A current Wordperfect user, Dein-

Continued on page 40

What's the word?

Word processing vendors with their eyes on converting users to Windows versions face an uphill battle



Source: Computer Intelligence

Everex to parade new product line at Comdex

BY MICHAEL FITZGERALD
CW STAFF

FREMONT, Calif. — Everex Systems, Inc. will mix the present with the future at Comdex/Fall '91 this year when it announces two new portables and two new families of desktops and displays products that are not slated to ship until next year.

According to Mark Marlow, Everex's vice president of marketing, the company will announce a 5.2-pound Tempo notebook, code-named the V3, based on Intel Corp.'s 80386SX chip, as well as a 12-pound AC-powered laptop with an active-matrix color screen and based on Intel's 33-MHz and 50-MHz I486 chip [CW, Sept. 2].

On the desktop side, Everex will announce upgradable versions of its Tempo line as well as a separate group of compact Tempos. These products are scheduled to ship within 30 days of the Comdex show.

Marlow confirmed that Everex will show several products aimed for release within three to six months, among them a hardware-level, fault-tolerant multiprocessor that represents a significant design advance over Everex's just-shipping Step MP.

Everex also plans to display a book-sized 386SX PC with 2½-in. hard drives, positioned as a node on a local-area network, and a tape backup system said to be aimed at achieving a 30M-byte/sec. backup capability.

Prototype on display

Marlow also said Everex expects to display, at Intel's booth, a prototype Tempo notebook based on a version of Intel's 386SL power management chip, but he declined to confirm that it would be Intel's new 25-MHz SL.

Marlow said a prototype "PCMac" integrated personal computer, with the monitor, a tape backup and networking capabilities built into a box, will probably not be developed.

Everex has yet to determine pricing on the products. The color laptop will likely sell for about $8,000, while the Tempo modular line will probably be close to today's Tempo price, which starts at $1,699 for a 25-MHz 386SX, the company said.

The modularity is built on a passive-backplane architecture, which will allow users to upgrade from the 25-MHz 386SX all the way to a 50-MHz I486. Everex will probably skip either the 16- or 20-MHz version of the 486SX chip, Marlow said.

The small form-factor Everex line will probably offer less extensive modularity, though Marlow said Everex was not yet sure what it would be and that it will range from a 25-MHz 386SX to a 33-MHz 486.

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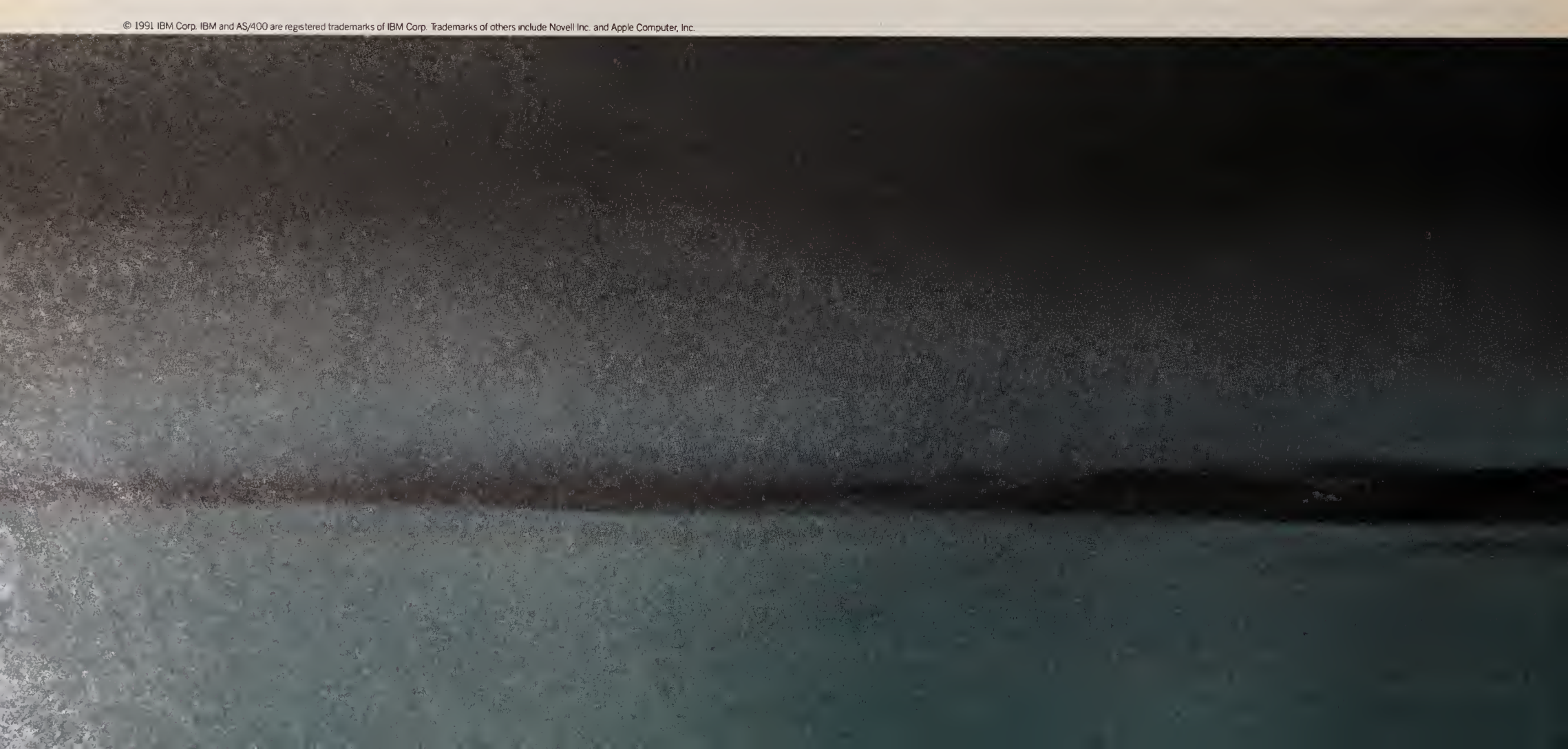

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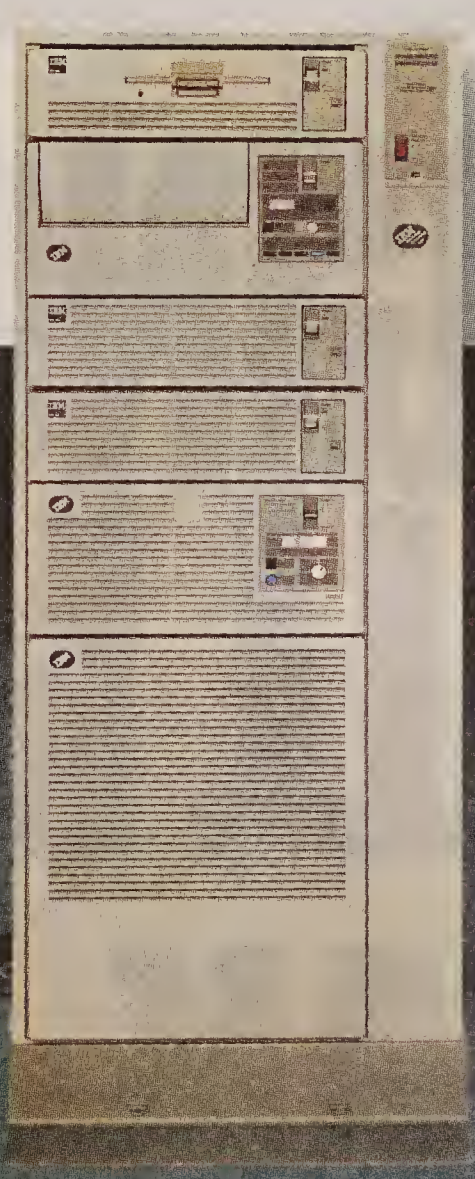

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Workstation introductions span RISC marketplace

BY CHRISTOPHER LINDQUIST
CW STAFF

The reduced instruction set computing (RISC) graphics workstation market received a few more entries recently — one from an established vendor and others from a new participant in the tumultuous arena. Both companies claimed to be working with "open" standards.

The introductions hit the upper end of the market with a server and the entry level, where a workstation can come in at less than $8,000.

Intergraph Corp. announced the Interserve 6605 server and demonstrated it at the Intergraph European Graphic User Group Conference in The Hague two weeks ago. The $75,000 Unix-based system reportedly can achieve 40 million instructions per second and 12 million floating-point operations per second. It comes standard with 64M bytes of system memory, expandable to 832M bytes; 1G byte of disk storage, expandable to 30G bytes; and a 12-slot case.

The new competitors in the RISC market came from Okidata Microsystems, a division of Oki America, Inc. The company unveiled a line of workstations based on Intel Corp.'s I860 RISC microprocessor. The four 7300 series systems will be targeted at four markets within the business and government sectors: document image management, decision support systems, computer-aided professional publishing and geographic information systems.

Oki Microsystems' 7300 series *will be targeted at decision support, GIS, publishing and image management*

All Okidata systems come standard with the OKIX AT&T Unix System V-based operating system, a display, a built-in Ethernet port, Transmission Control Protocol/Internet Protocol and Network File System support, Small Computer System Interface support for as many as seven devices, two RS-232 ports and a choice of keyboards. Display, disk storage and tape storage options are also available.

The products include the Okistation 7310 diskless workstation at $7,995, the Okistation 7320 series workstation priced from $13,985 to $23,935, the Okistation 7330 from $15,580 to $31,100 and the Okiserver 7335 workgroup server from $26,235 to $39,655. All prices depend on configuration.

HP targets graphics users with first 486SX

Family of machines aimed at 'power users'

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co. made its entrance into the Intel Corp. 486SX market last week with the release of a family of 20-MHz systems.

At the top of the line, the HP Vectra 486S/20 is aimed at financial and computer-aided design (CAD) markets, according to Bhupinder Saluja, product manager for HP's Personal Computer Group. The four of the five models include an HP Ultra VGA Graphics card to speed Microsoft Corp. Windows and CAD applications as well as the ability to operate as a local-area network server, Saluja said.

Additionally, the computer's box can either be set on its side or function on the desktop. It has hardware and software security locks.

The company also announced Vectra Models 386/16N and 386/20N, which are available in a LAN-ready configuration as well as stand-alone. "They're ready to boot off the server when taken out of the box," said Aurora Belarmino, also a product manager.

Belarmino said the PCs have been tested with LANs using software from Banyan Systems, Inc., Microsoft, Novell, Inc. and The Santa Cruz Operation.

The 486S/20 ranges in price from $4,499 to $8,599 and is fully configured. The 386/16N begins at $1,749 for a diskless model and tops out at $2,674. Model 386/20N starts at $2,049 and fully configured costs $3,149.

Users want quality for less, study says

BY MICHAEL FITZGERALD
CW STAFF

SAN JOSE, Calif. — Users overall find their workstations high in quality, but would like to pay less money for the machines, according to a recent study.

Dataquest, Inc., a market research firm based here, recently published its Score Report: Product Improvement Index for workstations. The report covered all the major workstation vendors and rated them on eight items, including quality, commitment to customers and value.

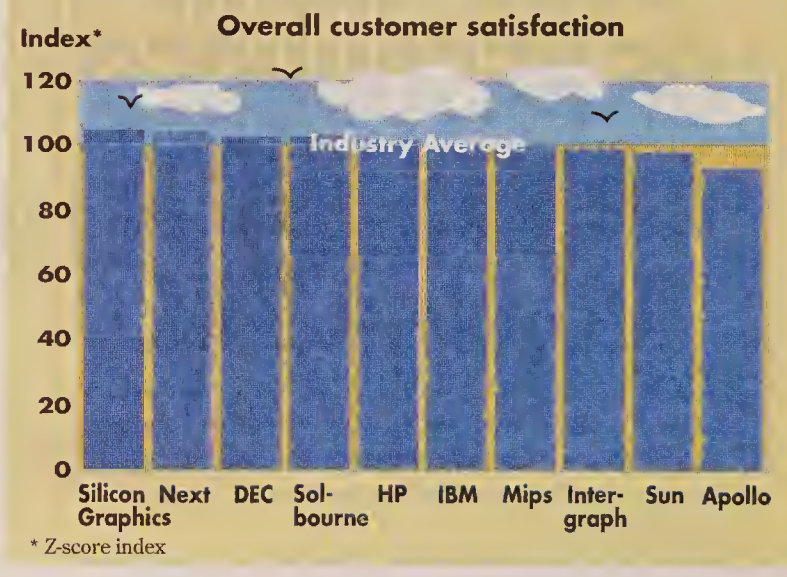
Dataquest interviewed 900 users, between 70 and 125 per vendor. Each user was asked 48 questions relating specifically to the predominant workstation in use at the site. Dataquest markets its Score Reports to vendors.

According to the study, customers said product quality, vendor commitment and price were their biggest concerns when buying products. Dataquest representatives said the survey showed that the workstation market, projected to buy 550,000 machines this year, was moving toward a commodity market.

While all 10 vendors surveyed fared well, Silicon Graphics, Inc., Next, Inc. and Digital Equipment Corp. ranked highest in terms of overall customer satisfaction, and Sun Microsystems, Inc. and Apollo Computer, Inc. ranked lowest.

Above par

Silicon Graphics users give their vendor the highest satisfaction rating, but three leading workstation suppliers fell below the industry average



Source: Dataquest, Inc.

CW Chart: Janell Genovese

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Wordstar banks on Windows version

BY CAROL HILDEBRAND
CW STAFF

Wordstar, Inc. would love to be a market leader once again — but it'll settle for profitability. And the company is hoping Wordstar for Windows will be the answer.

Wordstar, whose flagship products Wordstar 6.0 and Wordstar 2000 were the bellwethers of word processors in earlier, Wordperfect-less days, recently announced Wordstar for Windows, the company's product path for its estimated 450,000 users. The new package is based on the word processing engine of Legacy, which Wordstar licensed from NBI, Inc. and previously remarketed under the Wordstar banner.

With the new product slated to ship sometime in the next several weeks, company officials said they would retire Legacy from the lists, although they will continue to support users.

Analyst reaction, although enthusiastic about Wordstar's feature-rich upgrade and functionality, was a bit tempered by the comeback job facing the Novato, Calif.-based company. Wordstar recently announced losses of $7.5 million for fiscal 1991, compared with a loss of about $4.5 million the previous year.

Gladys Francis, an analyst at Dataquest, Inc. in San Jose, Calif., said that with the new Microsoft Corp. Windows-based word processors all rivaling each other for fancy features, "it all comes down to marketing skill. They've got to learn to market it like crazy."

Wordstar is equipped with a variety of graphics and page layout features that the company said almost put it in a desktop publishing category. John Allen, a beta tester at Letec Corp., a systems integrator in Setauket, N.Y., compared it favorably with both Ventura Publisher, from Ventura Software, Inc., and Aldus Corp.'s Pagemaker.

However, he said, "I'm not sure that people who just want to produce a document are going to appreciate that."

Other features include what-you-see-is-what-you-get editing capabilities for text and graphics, the popular style templates and Document Data Exchange support as well as extensive DOS file referencing. Another benefit is that users can choose between Windows commands or the more familiar character commands from either Wordstar 6.0 or 2000.

"Wordstar has gone out of its way to create interfaces so that people can be comfortable in the new environment," Allen said.

Wordstar for Windows is priced at $495. Users of Wordstar Legacy can upgrade for $49, while users of character-based Wordstar and users of any other character- or Windows-based product can upgrade for $129.

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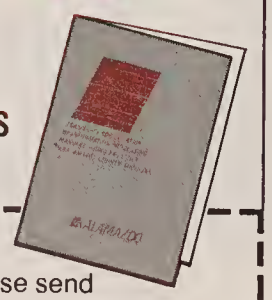

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Windows

FROM PAGE 35

berg has looked at Windows versions of Ami Pro and Wordperfect and has decided to hold out for the latter.

"Realistically, you just can't get everybody to move over at the same time," agreed Dan Ness Jr., an analyst at Computer Intelligence in La Jolla, Calif.

Of vital importance is the ability to easily swap files back and forth between the old and the new environments. Ness estimated that only a little more than a third of currently installed personal computers can run Windows. While the slow process of upgrading IBM PC XTs, ATs and Intel Corp. 80286s goes on, coexistence of the two platforms is key, he said.

Not surprisingly, each major Windows word processor contains a conversion program that can read almost any existing character-based word processing file, analysts said.

Many also dangle extra ease-of-migration carrots. For example, Word for Windows offers a pull-down menu that helps translate character commands from such competitors as Wordperfect and Multimate. A free package currently in the works at Lotus is aimed at helping customers move their data more easily into the Windows environment.

> USERS EXPECTING to coexist with character-based and graphically based packages do not seem in any hurry to move to Windows.

Vendors are also embarking on an aggressive round of bargain-basement upgrade offers in an effort to tempt users to jump ship. Any DOS-based user can upgrade to Ami Pro, for example, for $129, although street prices are more like $99. "It will be like the gasoline price wars. That will be a big consideration," said Timothy-James Lee, a consultant in Winnetka, Calif.

One user has already been swayed. "I went with whoever had the cheapest upgrade," said Doug Thompson, software engineer at Schlumberger Industries in Norcross, Ga.

However, a 70% market share will be difficult to imperil. Wordperfect, which maintains a toll-free support line, has built its empire on exhaustive phone support, and users factor that into their decision.

"They support what they sell real well now, so why should they fall down at Windows?" Deinberg said.

The inertia factor also plays a role: Steve Isenberg, engineering services manager at Easel Corp. in Burlington, Mass., is sticking with Wordperfect as well. He said that although the features from some other products sounded tempting, he had an investment in Wordperfect.

That old familiarity will be enough to make him wait until Wordperfect's product hits the shelves, he said.

Fitzgerald

FROM PAGE 35

made money on personal computers since the mid-1980s. "That's ridiculous!" retorted IBM spokeswoman Tara Sexton, who added that if IBM weren't making money, it wouldn't be making PCs.

The old bait-and-bait trick. Zeos says it ships computers within five days of order placement, but customers report waiting much longer than that for the mail-order house's new $1,795 modular 486/33 PC. While Zeos originally told buyers interested in the 33-MHz box that delivery could take two weeks, some callers report waiting as long as four weeks.

Zeos spokesman Rick Apple acknowledged that the company took orders for the box but didn't ship any because "it's the last one we worked on, and we were fine-tuning the BIOS." Sources close to Zeos said it told its underwriter the BIOS was buggy, but Apple denied this.

At this point, Zeos has started shipping the box, but callers to the company still report being told it will take four weeks to get it: three weeks to build and one to ship. (The same goes, incidentally, for Zeos' new 486SX/20). Zeos is either swamped with orders or having problems making the machines. The company says it has no problems making the machines.

Pencil us curious. Grid Systems may get into the business of licensing its handwriting recognition software. Sources close to Grid say the company is pushing to license Gridpen to other vendors.

Wang may be first, said the source — it demonstrated Gridpen at a recent pen-based computing show.

Grid, meanwhile, is telling prospects that it expects to have a 386-based tablet product out sometime in mid- to late 1992.

No cause for alarm. Some users were left uneasy after AST Research's stock took a brief hit on Wall Street recently, and one analyst sent out a report saying the BIOS of its Premium Exec 386SX notebook was incompatible with some software, including Lotus' 1-2-3 Version 3.01.

The analyst's report was incorrect, though: AST confirms that perhaps five of its 30,000 notebook users have run across the problem where the arrow keys insert numbers, and it occurs only with certain external keyboards.

All received free BIOS upgrades, and the version's incompatibility has been fixed. "It's no big deal," AST said. Wall Street seemed to agree: The stock bounced back quickly.

Fitzgerald is a *Computerworld* senior writer.

Hollywood 1.0: Handy but needs refining

Technology Analysis — a roundup of expert opinions about new products. Summaries written by New Products Writer Derek Slater.

IBM's Hollywood 1.0 ranks among the best high-end presentation software packages, according to reviewers. Running under Microsoft Corp.'s Windows 3.0, Hollywood lacks a few specialized features but offers strong charting and great presentation tools.

Ease of use: Hollywood can prove inflexible at times, reviewers said, and the menuing system needs streamlining. Using the powerful features requires some practice. On the plus side, each presentation is stored as a single file.

Charts: Text charts can be created or imported from word processors, bulleted and checked for misspellings. Numeric chart templates are numerous and easy to edit. Calculation and accurate print previews are missing.

Graphics: Imported graphics suffer from some quirky limitations, and the clip-art collection is small. Hollywood offers coloring and drawing tools.

Tools: Hollywood's presentation effects — layering, fades, wipes and zooms among them — are outstanding. Editing tools give users a lot of control over the finished product.

Value: IBM's package needs some refining, but overall reviews said it is a strong value at $495.

IBM's Hollywood 1.0

Reviews	Ease of use	Charts	Graphics	Tools	Value	Overall
Infoworld 7/8/91	Good	Good to very good	Small clip-art library	Excellent	Very good	7.4*
PC Week 6/24/91	Satisfactory	Good	Drawing tools particularly powerful	Noteworthy template feature	NC	One of the better programs
PC Magazine 7/91	Rigid	Charts shine	Import/export could be improved	Razzle-dazzle effects	NC	Too good to pass up
PC/Computing 6/91	NC	Transfers data easily	Impressive drawing tools	Toolbox is a standout	NC	All the tools you need
Users						
Elizabeth Wood, Egeland, Wood & Zuber, Inc.	■■	■■	■■	■■	■■	Best on the market
Sal Merchant, Conner Peripherals	■▗	■▗	■▗	■■	■■	Great for multi-page presentation
Kelley Anderson, Deloitte & Touche	■■	■■	■■	■▗	■■	Extremely effective; easy to use
Analysts						
Rich Bader, *PC Letter*	■▗	■▗	■▗	■▗	■▗	Good but has some deficiencies
Jake Richter, Panacea, Inc.	■	■■	■	■▗	■	Uses generic approach

Key: ■■ Very good ■▗ Good ■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1 to 10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Sheldon Grodsky, Kenneth, Jerome & Co.	■■	■
James Paper, Kirkpatrick, Pettisa	■▗	■

IBM reported profits of $114 million on revenue of $14.7 billion for the second quarter of 1991, which ended in June. This compares with $1.4 billion in profits on $16.5 billion in revenue for the second quarter last year.

IBM responds

Benjamin Godley, product and marketing administrator:

Charts: It's about as WYSIWYG as you can get. If you use the templates, it eliminates many surprises.

Graphics: We give you the ability to edit clip-art files and crop bit-mapped images. We offer more flexibility with computer graphics metafiles than most products.

Powerpoint 2.0: Ease of use key attraction

Microsoft's Powerpoint for Windows 2.0

Reviews	Ease of use	Charts	Graphics	Tools	Value	Overall
Infoworld 11/19/90	Very good	Basic capabilities	Good	Rudimentary screen shows	Very good	7.2*
PC Week 6/24/91	Good	Satisfactory	Adequate	Creates consistent appearance	NC	Appealing emphasis
PC Magazine 5/14/91	Easy	Incorporates Excel 3.0 charts	Drawing tools minimal	Myriad of time-savers	NC	Editors' choice
PC World 6/91	Excellent	Good	Good output	Excellent	Excellent	Best buy
Users						
Bill Warden, Weber Management Consulting, Inc.	■■	■▗	■▗	■■	■■	Best on the market
Robert McKay, RMM Consulting	■■	■	■▗	■■	■▗	Charting module is very weak
Kelley Anderson, Deloitte & Touche	■■	■	■■	■▗	■■	More difficult to set up than Hollywood
Joseph Paulin, Mitre Corp.	■▗	■■	■▗	■▗	■▗	Not enough reshaping tools
Analyst						
Jake Richter, Panacea, Inc.	■▗	■▗	■▗	■▗	■▗	Very easy to get started

Key: ■■ Very good ■▗ Good ■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1 to 10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Peter Rogers, Robertson, Stephen & Co.	■■	■■
W. Christopher Mortenson, Alex. Brown & Sons, Inc.	■■	■■

Microsoft, based in Redmond, Wash., reported fiscal year ending June revenue of $1.8 billion, an increase of 55.8%, and pretax income of $670.6 million, a 36.4% increase over 1990.

Microsoft responds

Cathy Harris, product manager:

Tools: Powerpoint is focused on the business presenters, most of whom don't feel they have a lot of graphics skills. We try to put some intelligence in the product, so 90% of the things anybody wants to do are easy to do. In working on Powerpoint 3.0, we are trying to increase the power while making it even easier to learn.

Powerpoint for Windows 2.0, Microsoft Corp.'s presentation package, is older than many of its high-end competitors, but it compares well to each of them. It has fewer drawing tools but still produces impressive presentations and offers a slick, easy-to-use interface.

Ease of use: Powerpoint is intuitive and streamlined, reviewers said. There is a screen-by-screen rehearsal function, which lets users point and click their way through any show, providing peace of mind for the nervous presenter.

Charts: For number charts, Powerpoint works best in conjunction with a spreadsheet, allowing users to import ready-made charts. Dynamic data exchange is not supported, however. Text charts are easy to create.

Graphics: *PC World* called the color controls "astounding." The clip-art library is extensive, and many graphics file formats can be imported.

Tools: Though it lacks various editing tools and offers no special effects for screen shows, Powerpoint earned high marks by offering users excellent control over presentations. Output quality for notes and handouts is strong.

Value: At $495, Powerpoint is an excellent value. It majors in turning imported information into outstanding presentations without a great deal of work on the user's part.

Pen-input tool aids illiterate workers

ON SITE

BY MEL MANDELL
SPECIAL TO CW

Even illiterate workers can now use computers productively. Inspectors and repairmen at Ford Motor Co., some of whom cannot read, have been using pen-input portables since 1988 to record defects in and repairs to newly assembled vehicles.

Because the single-page checklists they fill out rarely change, those who cannot read are able to memorize — with the aid of co-workers — what each field stands for. According to Martin Welch, an engineer at Ford's Dearborn, Mich., assembly plant, between 5% and 10% of the workers equipped with the devices are illiterate. He cannot determine the exact percentage because the workers will not admit to their handicap.

The pen-input device they use is the $1,595 Scriptwriter, which was introduced in 1987 by Data Entry Systems in Huntsville, Ala. Two groups of workers use the devices: front-end inspectors and repairmen. The inspectors check the front-end alignments of a small sample of vehicles per shift. At the beginning of each shift, a paper checklist is slipped onto the sensing surface of the portable device and never changed. As the inspector touches the fields, the sensing surface picks up the marks, which are translated into digits and broadcast back to a nearby IBM Personal Computer.

The only handprint recognition involved is the vehicle's four-digit "rotation number," which is displayed in a large font on a tag attached to each vehicle. In this application, the device's batteries provide enough power for each shift, which can last up to 10 hours. In the repair application, the Scriptwriters are mounted on a table and plugged in so there is no need to change batteries. As each previously noted defect in the electrical system or internal hardware is repaired, this fact is entered via the Scriptwriters.

The information is collected on IBM Personal System/2s and stored in Workbench, a $1,500 database management system from XDB Systems, Inc. in Laurel, Md. The data is reviewed daily by foremen and weekly by quality-control experts, Welch said.

Thomas Scott, president of Data Entry Systems, said Ford bought about 250 Scriptwriters. He also said that Daimler-Benz AG has purchased Scriptwriters for a similar inspection application for one of its overseas Mercedes plants.

The Dearborn application competes with another approach that does not require literacy: Inspectors at Ford plants in Atlanta and Minneapolis record defects through microphones worn close to their mouths. Their comments are picked up by a voice recognition system and then forwarded to the PCs on which they are stored.

Welch, the engineer who initiated use of the Scriptwriters, said they work faster than the voice recognition system.

Welch reported three other pluses for the pen-input devices: ease of training — on average, it takes only 30 minutes for workers to learn to use the devices; ease of programming; and ruggedness.

Mandell is a New York-based writer.

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Price-cut war rages onward

BY MICHAEL FITZGERALD
CW STAFF

A flurry of responses to Compaq Computer Corp.'s new line of modular personal computers and Intel Corp.'s new I486SX chips [CW, Sept. 16] is likely to soon turn into a whirlwind of price cuts and new product announcements.

Austin, Texas-based Dell Computer Corp. last week cut prices by as much as 33% on its existing products and will introduce upgradable systems based on Intel's new 25-MHz I486SX chip as well as its 20-MHz 486SX and 33-MHz 486DX. Dell expects to begin shipping next month.

Advanced Logic Research, Inc. said that in response to Compaq's new modular PCs, it reduced prices on upgrade modules for its product lines by 10% to 50% and added a rebate program. A user who wants to purchase a 486/33 upgrade module can do so for $1,795, minus $200 with a rebate.

Arche Technologies, Inc. in Fremont, Calif., will begin shipping the Legacy 486SX-25 and Master 486SX-25 at Comdex/Fall '91 late next month, the company said. Pricing was not announced, but an Arche spokesman said the boxes would probably sell for less than $4,000.

Epson America, Inc. also said it will begin shipping a box based on the 486SX/25 late this year. The Torrance, Calif.-based company will sell the 486SX/25 Plus with 4M bytes of random-access memory, expandable to 16M bytes, and offer a 200M-byte hard drive. Pricing was not released.

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NEW PRODUCTS

Macintosh products

Insignia Solutions, Inc. has announced Universal Softpc Version 2.5 for the Apple Computer, Inc. Macintosh.

The product allows Macintosh users to run DOS applications. Version 2.5 adds support for Novell, Inc.'s personal computer networking software, compact disc/read-only memory storage and Apple's System 7.0 operating system.

The product costs $399.

Insignia Solutions
526 Clyde Ave.
Mountain View, Calif. 94043
(415) 694-7600

Terralogics, Inc. has made available a tool kit for developing mapping applications on the Apple Computer, Inc. Macintosh platform.

Terraview is optimized for fast retrieval of spatial data from magnetic and compact disc/read-only memory storage media, the company said. It works with applications in C language and Pascal. A module for developing interfaces consistent with the Macintosh is included.

Terraview costs $3,495.

Terralogics
Suite 256
114 Daniel Webster Highway S.
Nashua, N.H. 03060
(603) 889-1800

Development tools

The Whitewater Group, Inc. has announced Version 4.0 of Actor for the Microsoft Corp. Windows 3.0 environment.

Actor 4.0 is a pure object-oriented programming platform for personal computers, the company said. It offers new access to SQL database programs as well as multiple inheritance and an enhanced Objectwindows class library.

The program costs $249. The professional version, including SQL libraries and a resource tool kit, costs $495.

The Whitewater Group
1800 Ridge Ave.
Evanston, Ill. 60201
(708) 328-3800

Systems

Copam USA, Inc. has added systems to its upgradable personal computer line.

The 386SXB/20 provides 16K bytes of cache memory and costs $1,288. The 386B/40 is priced under $2,500.

The company also announced a system based on the Intel Corp. 50-MHz I486 processor, to be priced under $4,000.

Copam USA
45875 Northport Loop E.
Fremont, Calif. 94538
(415) 623-8911

Software applications packages

Serif, Inc. has created Pageplus for Windows, a low-price ($149) desktop publishing software package for the Microsoft Corp. Windows 3.0 environment.

Pageplus offers full page and image-rotation capability, typographic control and extensive import/export features.

Serif
P.O. Box 803
Nashua, N.H. 03061
(603) 889-8650

Peripherals

Emerson Computer Power, a division of Emerson Electric Corp., has introduced the Accucard 386, a half add-in card for controlled shutdown of a personal computer during power failure.

The rechargeable card records all data in main, extended and expanded memory in the event of a power failure. Data is stored on the computer's hard drive before the card powers down the PC. Upon restoration of power, the card restarts the system where it was shut down.

The Accucard 386 is priced at $249.

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15041 Bake Pkwy.
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The Darius HRV-1024 ($799) provides 1,024- by 768-pixel resolution and is compatible with VGA and Super VGA cards. The Darius TSM-1431 triple scan monitor ($899) works with any video card and offers 0.28mm dot pitch and 1,024- by 768-pixel resolution.

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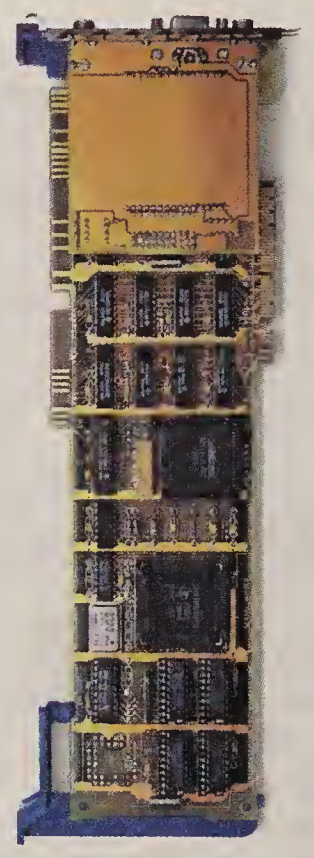

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NETWORK SHORTS

Vendors display SMDS tool

A Switched Multimegabit Data Service (SMDS) interface was recently demonstrated by smart-hub maker **Ungermann-Bass, Inc.** and local telephone company **Pacific Bell.** The two vendors said they proposed the interface as a standard to the SMDS Special Interest Group meeting along with **Advanced Computer Communications, Digital Link Corp., Verilink Corp.** and **Wellfleet Communications, Inc.** UB has also opened a training center in Cincinnati for customers and business partners in the Central, Southern and Eastern U.S. regions. The curriculum addresses implementation and operation of local-area networks.

Data General Corp. and **Digital Analysis Corp.** teamed up recently to provide public sector and commercial customers with network management capabilities over both Transmission Control Protocol/Internet Protocol and Open Systems Interconnect communications networks. This will allow the two companies to design and implement an integrated Simple Network Management Protocol/Common Management Information Services and Protocol system.

FCC sheds light on Tariff 12

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — In what was seen as a mixed bag for telecommunications users, the Federal Communications Commission cleared up some of the questions about Tariff 12 left over from its Aug. 1 decision to ease regulation of AT&T.

Tariff 12 provides large users with customized packages of voice and data services at large discounts off standard component prices, generally for periods of three to five years. Questions about its legality have caused anxiety for existing customers and, according to AT&T, have inhibited new users from signing up for the popular offering.

On Aug. 1, the FCC said it would ease restrictions on AT&T's provision of high-end business services such as digital private lines. It said, for example, that it would allow AT&T to negotiate contracts with customers much as its competitors do, rather than simply filing tariffs of publicly available prices and terms. AT&T would be given more flexibility with contracts than with Tariff 12, including the ability to write them for single services.

However, the commission said it would not allow either contracts or Tariff 12 packages to include 800-number services until technology allows customers to keep their 800 numbers when switching carriers. The portability of 800 numbers is expected to be possible in 18 months, at which time AT&T will no longer have an unfair competitive advantage, the FCC said.

> LEGAL QUESTIONS SURROUNDING Tariff 12 may have inhibited new users from signing up for it.

The FCC "grandfathered" Tariff 12s with 800 services in them prior to Aug. 1, without making it clear whether it would consider for approval those deals under negotiation before that date. In details spelled out two weeks ago in a 78-page report and order, the FCC took a hard line and said Tariff 12s with 800 service filed after Aug. 1 would not be approved. That throws into limbo some 15 Tariff 12 applications filed by AT&T in August, which the carrier said had been in the works for months.

An AT&T spokesman said last week that he did not know whether or how AT&T might renegotiate those deals without 800 service. "But these customers need to be served by some integrated services deal. We need to figure out how to do that."

The FCC cleared up another uncertainty by ruling that the grandfather provision applied to the 92 Tariff 12 options already

Continued on page 52

Saber to simplify LAN administration

BY JOANIE M. WEXLER
CW STAFF

Companies viewing their local-area networks as segments of a larger, corporatewide entity may find a cohesive way of administering functions across LAN boundaries at Networld Dallas next month.

Saber Software Corp. plans to announce its LAN Administration Architecture — an integrated set of LAN administration tools that span multiple vendors' LAN operating systems — at the show, which will be held Oct. 15-17.

Saber said the $795 tool set will provide the network administrator with a single interface to handle disk monitoring, event logging, file auditing, software license monitoring, hardware inventory, scheduling and anti-virus tasks.

Users and analysts noted that currently, network operating systems such as Novell, Inc. Netware, Banyan Systems, Inc. Virtual Networking Software and Microsoft Corp. LAN Manager, as well as some third-party products, provide stand-alone modules for each of these functions that are network-specific and not integrated.

Ease of use sought

"Right now, if I want to monitor the utilization of a server, there are a couple of places in Netware I have to look to get the total picture. Then I have to do that at each server," said Rhoda Stein, assistant vice president of the Private Banking Division at Manufacturers Hanover Trust Co. in New York. "I'd like a facility to initiate a utilization monitor across all servers in a predetermined setup to give me a total snapshot."

Added Mark Oswald, manager of information technology at Pittsburgh's Children's Hospital, which uses Saber's existing administration tools, "There is value in one consistent user interface and having just one point for technical support."

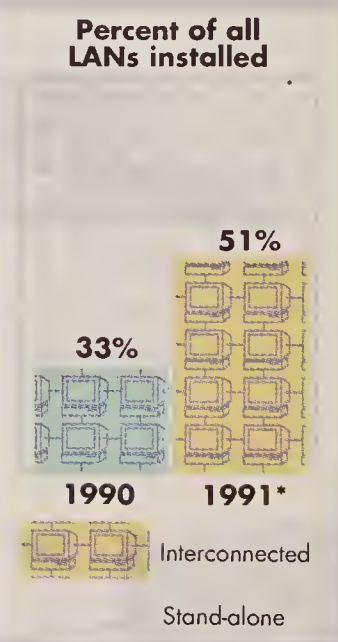
LAN administration is a subset of the larger concept of network management. Network management — where the LAN operating system vendors concentrate their development efforts — concerns itself with controlling network resources, access to network paths and recovery from communications link failures. LAN administration addresses user authorization, authentication and backup and recovery from system failures.

Whether a company needs an integrated set of LAN administration tools depends, in part, on the role of individual LANs in the enterprise, said Tom Nolle,

Continued on page 52

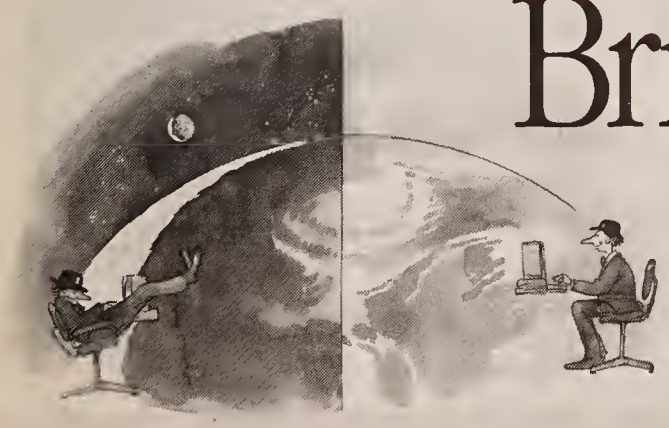
Link'em up

A one-year 54% growth in LAN linkages could fuel the need for standard LAN administration tools



Base: 400 Fortune 1,000 firms
* Average number of network operating systems per company: 2.54

Source: Business Research Group
CW Chart: Janell Genovese



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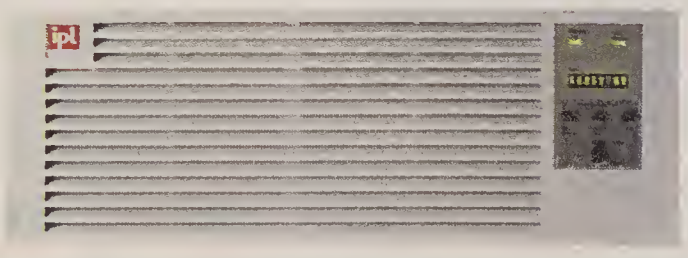

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Netlink strengthens LAN-SNA links

Products let users and vendors build two-way access between local nets and high-end systems

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — Netlink, Inc., a small company with sterling Systems Network Architecture (SNA) credentials, is presenting itself as a white knight for both users and bridge and router vendors that want to integrate IBM's protocols with popular local-area network protocols such as Transmission Control Protocol/Internet Protocol (TCP/IP) and Digital Equipment Corp.'s Local Area Transport.

On the user front, Netlink last week introduced two products that respectively allow LAN devices to access SNA resources and SNA devices to access LAN connections.

While vendors such as Openconnect Systems, Inc. — not to mention IBM — offer products that encapsulate TCP/IP so that it can run over an SNA network, or vice versa, products that fully support both SNA and LAN interconnectivity are still conspicuously missing from the market, according to Tom Wood, a senior analyst at Business Research Group in Newton, Mass. "This is the kind of thing customers are clamoring for. End users want, one, to connect LANs and host networks and two, to make it simpler."

Netlink's first introduction, SDLC Link Server, is said to convert traditional IBM Synchronous Data Link Control traffic so that it can travel over an Ethernet or IBM Token Ring LAN and from there, travel out over LAN bridges and routers. While IBM does provide Token Ring and Ethernet boards for its newer communications controllers such as the 3745 and 3172, Netlink's server also provides LAN connections for older SNA devices that lack such links, according to Michael Bowman, Netlink's vice president of marketing.

The device can handle up to 16 64K bit/sec. lines. It is priced from $6,490 to $23,000 and will be available in November, Netlink said.

The vendor also announced the Internetwork SNA Gateway, which is said to allow LAN devices to access resources over an SNA network via either DEC's Local Area Transport terminal-to-host protocol or TCP/IP.

While other vendors do provide similar connections, many are in the $25,000-and-up range, Bowman said. In contrast, Netlink's gateway is priced at $7,000 and up. Local Area Transport support for the device is scheduled to be available by year's end, with TCP/IP Telnet support scheduled for 1992, Netlink said.

While neither of the above products is groundbreaking, one attribute that differentiates them from other similar offerings is their network management capabilities, Wood said. Both offerings will incorporate agents to allow them to communicate with IBM's Netview, DEC's Terminal Server Manager and the Simple Network Management Protocol systems, Netlink said.

> "END USERS WANT, one, to connect LANs and host networks, and two, to make it simpler."
>
> TOM WOOD
> BUSINESS RESEARCH GROUP

Netlink said it is also seeking development partnerships with interconnectivity vendors that want to implement SNA on their bridges and routers, Bowman said. He said he could not name any companies that had finalized such an agreement. However, Netlink did announce a technology transfer and OEM agreement with Vitalink Communications Corp. a year ago, and Vitalink last week announced its own versions of the Netlink products described above.

Cisco Systems, Inc. and Brixton Systems announced a partnership at Comnet '91 last January, which has been working on a similar type of SNA-router integration. The two companies said they were working on enabling Cisco routers to interconnect LANs over SNA front-end backbones using IBM's PU4 protocols. The products are due to be announced officially just prior to Comnet '92 in January, according to Doug Tsui, Cisco product marketing manager.

Netlink does not plan to support PU4, which essentially allows a router to send LAN transmissions to an IBM front-end processor backbone, Bowman said. Instead, Netlink will work with router vendors to incorporate IBM PU2 and PU2.1 protocols into their devices so that a router can send SNA traffic directly to another router without having to go through an IBM front end or Advanced Peer to Peer Network system, he added. The only drawback of this arrangement is that the router does not have access to IBM front-end or APPN tables, so the router must know the source and destination of its message.

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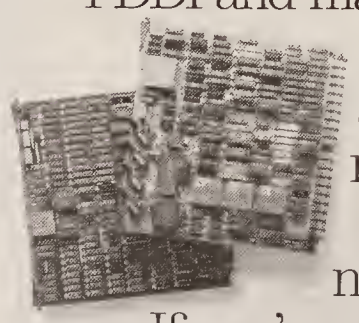

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Novell mum about OSF, UI support

BY JOANIE M. WEXLER
CW STAFF

Novell, Inc.'s role in the open systems efforts humming along at the Open Software Foundation (OSF) and Unix International is a question mark.

Unlike local-area network competitors Banyan Systems, Inc. and Microsoft Corp., which have both aligned with the OSF, the LAN market leader has announced no commitment to make its Netware LAN software interoperable with either consortium's distributed computing and management environments.

The OSF and Unix International both made announcements this month surrounding their respective integrated software packages [CW, Sept. 23], neither of which has been sanctioned by Novell. However, one user commented that the success of industry-standard distributed computing and management environments could hinge on Novell support.

"Novell is the wild card in all this," asserted Bill Conley, manager of information technology services at Loral Aerospace Corp., a Netware user in Newport Beach, Calif. "I've long felt a standard distributed computing environment was a great idea. All but the most true-Blue or small shops will need it. Novell should be more verbal about this. They own such a big piece of the networking environment, it will be difficult for [the OSF's Distributed Computing Environment] to take off without them."

Silence of the LANs

Others view Novell's silence as the natural response from the dominant LAN vendor. They reasoned that Novell has little to gain by sharing the LAN services that have won the firm nearly 60% market share by contributing its technology to be integrated into either group's "open" software.

"Why would they want to open up that large proprietary market share?" questioned Peter Storer, manager of information services at The Acord Corp., an insurance services consortium and Netware shop in White Plains, N.Y. "Netware is a superset of DCE; part of what the OSF is concerning itself with — such as access control — are the same kinds of things Novell addresses" and has made its fortune on, he observed.

The OSF and Unix International efforts rival each other as industry-standard "middleware" that integrates disparate hardware platforms and operating systems in a plug-and-play computing, networking and management environment. The two consortia are also developing separate versions of what they hope will ultimately be the industry-standard version of the Unix operating system.

The OSF's DCE and Distributed Management Environment and Unix International's Atlas, which combines a distributed computing and management environment with some applications, are operating system-independent. However, most observers said they see the distributed computing/management initiatives of each camp as efforts to ease Unix into the traditional MS-DOS business environment.

One analyst asserted that "the only reason Novell might not announce support is to hurt Unix and keep its proprietary products," said Tom Wood, senior industry analyst at Business Research Group. "People are afraid to go to Unix because they don't know how to make that interact with their Netware."

"Netware in a distributed computing environment is not a big hot button for us right now," affirmed Joe Giljohann, senior microcomputer specialist for the city of Milwaukee, which runs nearly 40 Novell LANs. "When you run Portable Netware [Unix-based Netware versions for larger systems] as a job under Unix, both systems are open to you. We're looking to link Netware into a Unix environment to pass data back and forth, not to run in a distributed scenario."

Frank Michnoff, program director of desktop computing strategies at Meta Group, Inc. in Westport, Conn., predicted, "Novell will just bridge to those environments. I doubt it is going to rearchitect its products."

High-tech selections

Distributed computing announcements this month included technologies selected by the OSF for integration into its Distributed Management Environment and Unix International's technology selections for components of its broader Atlas product.

OSF's Distributed Management Environment:

- Tivoli Systems, Inc.'s Wizdom object-oriented management framework.
- Hewlett-Packard Co.'s Openview Network Management Server communications structure, HP Software Distribution Utilities and Network License Server.
- IBM's Data Engine server for monitoring and control of devices.
- Groupe Bull's application programming interface for a consistent means to access management protocols.
- Banyan Systems, Inc.'s Network Logger, which creates a repository of stored network events for later analysis.
- Gradient Technologies, Inc.'s distributed software licensing service, management and file transfer for PCs.

Unix International's Atlas:

- Retix Corp.'s Open Systems Interconnect communications protocols.
- Ally Software, Inc.'s Tuxedo transaction processing monitor.
- Sunsoft's Open Network Computing/Network File System.
- Tivoli Systems' Wizdom.

JOANIE M. WEXLER

Federal users take in network smorgasbord

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — "The most amazing thing is that they got it to work at all."

That statement sums up comments from many who viewed the Opennet Demonstration Network, a display of interoperability, at this month's Federal Computer Conference.

Indeed, the network and its attached array of terminals, servers, routers, bridges, hubs and processors physically resembled the Tower of Babel, with 55 vendors and $3 million in equipment in the act. But by rigidly adhering to government standards for open systems, eight federal agencies were able to bring up demonstration applications on the network in minutes or hours, said Dale Robinson, principal associate at Arlington, Va.-based CACI, Inc., which set up the network.

Actually a Transmission Control Protocol/Internet Protocol (TCP/IP) network, Opennet linked four Fiber Distributed Data Interface (FDDI) local-area networks across an FDDI backbone using internetworking equipment from Wellfleet Communications, Inc., Cisco Systems, Inc., Fibercom, Inc. and Cabletron Systems, Inc. — the first time all four have been tied together, Robinson said. Also attached were various Ethernet and Token Ring LANs with both Unix and non-Unix servers. All together there were about 100 processors — running about a dozen operating systems — from IBM Personal Computers to an Amdahl Corp. mainframe connected at a remote site.

Planning for the network started in February, and physical setup took about five weeks, Robinson said. No code was written or boxes built, he added.

Five vendors brought in Open Systems Interconnect products to run on top of TCP/IP. Robinson said vendors viewed the network as a near-real-world laboratory in which to test their claims for open systems.

The network, he added, also served as a laboratory for users, many of whom saw their problems and hopes reflected in parts of the 10,000-sq-ft cornucopia of networked products.

Tariff 12

FROM PAGE 47

on the books, not to the customers using them. That is, a customer today could choose an existing Tariff 12 option containing 800 service but could not negotiate a new Tariff 12 mix of services until 800-number portability is available.

The FCC is also expected to issue its ruling on the legality of Tariff 12 offerings soon. A year ago, a federal appeals court found fault with the way the FCC had earlier found Tariff 12 legal and asked the FCC to try again.

Henry D. Levine, a Washington, D.C.-based communications lawyer, said the FCC's recent rulings on AT&T presage its upcoming findings on Tariff 12. He said the FCC will find legal justification for Tariff 12 and that the new contracts option, called "contract carriage," will merge with Tariff 12 to produce one flexible telecommunications procurement option.

Levine said public filings for contracts will look like Tariff 12 filings, and that should reassure users who had worried that filings would be so detailed as to compromise confidential information about their operations.

However, Levine said a sweeping away of Tariff 12 in favor of contract carriage presents some potential risks to users, depending on how AT&T implements contract carriage. He also said AT&T has begun to get Tariff 12 billing — widely criticized by users as complicated and inaccurate — under control.

Levine said the recent FCC report and order contained a significant provision that, while not new in concept, was not revealed in its Aug. 1 decision. Called the "fresh look" principal, it says that AT&T must allow customers to terminate without penalty Tariff 12 agreements containing 800 services within 90 days of the availability of 800 number portability.

Saber

FROM PAGE 47

president of CIMI Corp., a consultancy in Voorhees, N.J. "If you tend to do projects by grabbing resources without regard to departmental boundaries, it isn't sensible to administer your LANs individually," Nolle said.

He estimated that currently, only about 0.5% of LAN users use LAN administration tools. "Where you see them almost exclusively is in interconnected LANs, which are growing pretty rapidly," he said.

Nolle stressed the importance of tools such as Saber's for the growing number of disparate network operating systems being linked. Business Research Group estimated that as of April 1990, the average number of network operating systems per Fortune 1,000 firm was 2.5.

"Without the tools integrated, users call the help desk and hear, 'We can help you with this but not that,' " depending on whose network they're using, Nolle explained.

"The range of tools available now is somewhat fragmented," agreed Larry Rudnick, assistant vice president at Dollar Dry Dock Bank in White Plains, N.Y. "We definitely want to administer our LANs from a central place. It would be nice if I could check for any user's disk space usage over 8M bytes on all file servers enterprisewide. I can't do that in one step right now."

The bundled Saber tools are slated to ship Nov. 1. Saber said the first release will integrate LAN administration functions across Netware, Vines and all LAN Manager-based networks. The package will support 50 users per server and will span MS-DOS and DOS/Windows platforms. Apple Computer, Inc. Macintoshes are slated to be integrated in 1992, Saber said.

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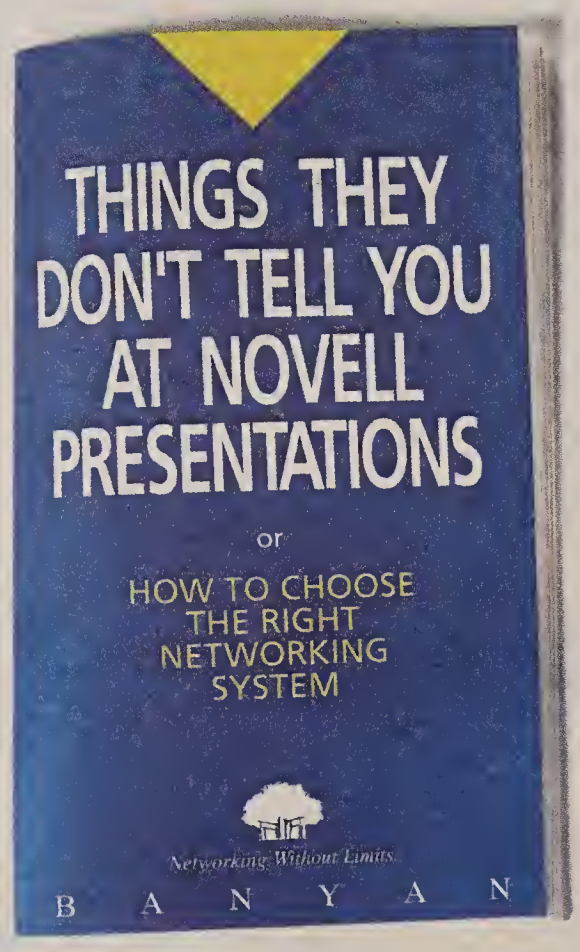

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Novell claims to simplify nets

BY JIM NASH
CW STAFF

PROVO, Utah — Novell, Inc., the market share leader of departmental server-based local-area networks, recently announced its intention to dominate the world of small, serverless networks with simplified software called Netware Lite.

If successful, the company, based here, could begin the process of making networks a commodity. Industry observers are sharply divided on how network users will be affected by the move.

Novell said it will ship Lite next month. It will be the company's first network operating system that enables DOS workstations to transfer files and share printers without a server.

Lite connects two to 25 personal computers for $99 each and will be sold through computer retail stores and Novell resellers. The company has hinted that it may even sell the product through computer superstores. It is still up to users to buy and install hardware, including cable and network adapter boards.

A spokesman for IBM said the company will resell Lite as it resells Netware 2 and 3. Ladd Timpson, Novell's product line manager for work group software, said the first 50,000 copies of Lite will contain a free version of Digital Research, Inc.'s DR DOS 6.0. Timpson said that the proposed merger between Novell and Digital Research is unlikely to mean bundling of DR DOS with other Novell gear.

The software allows PCs to work with other PCs as peers as long as the other desktops are running Lite. Workstations on a Lite network, according to Novell, can call up a master utility to see a list of directories and printers that are available. The list is replicated automatically in all workstations and updated each time it is summoned.

It will coexist with Netware 2 and 3, but at least one Lite workstation must be turned into a Netware gateway in order for there to be any communication between the environments. John Edwards, director of Netware product marketing, said users of a Lite network can use the gateway to map a drive from a Netware 2 or 3 network.

Craig Burton, principal and chief executive officer of Salt Lake City-based consulting firm Clarke Burton Corp., said Novell had created a "dead-end" product with no upgrade path to higher levels of Netware. Burton said Novell has not yet built an upgrade tool for Lite. He added that first-time network users would be in for a "shock" if they decided to upgrade to the more complex and expensive Netware lines.

Others were more upbeat. Tom Thibault, a Northern California Netware user group leader and Novell reseller in Walnut Creek, Calif., predicted Lite would work well as an inexpensive entry point for computer users.

NEW PRODUCTS

Host-to-host

Suite Software has released Version 2.0 of Suitetalk, adding support for Unix systems.

Suitetalk offers peer-to-peer communication for Digital Equipment Corp. VAX/VMS systems. The new version simplifies messaging in mixed VAX and workstation environments, the company said. It also adds a distributed data dictionary feature with network management capabilities.

Pricing runs from $2,500 on workstations to $100,000 on the DEC VAX 9000. Site licenses are available.

Suite Software
Suite 200
13747 Montfort Drive
Dallas, Texas 75240
(214) 980-9900

Local-area networking software

Peachtree Software has announced Peachtree Complete Network Accounting. The product comprises nine modules including General Ledger, Accounts Payable and Receivable, Invoicing and Fixed Assets. It runs under a number of network operating systems. Simultaneous multiuser capabilities are offered in five of the modules.

The product is priced at $695.

Peachtree Software
1505 Pavilion Place
Norcross, Ga. 30093
(404) 564-5700

Silverware, Inc. has provided interrupt-driven asynchronous communications for Fox Software, Inc.'s Foxpro 2.0 database management system.

Silverfox SPCS includes source code and supports 115K bit/sec. transfer rates and an unlimited number of communications ports. It provides a number of terminal emulations.

Silverfox SPCS is priced at $349.

Silverware
Suite 740
3010 LBJ Freeway
Dallas, Texas 75234
(214) 247-0131

Extended Systems has announced Extendbase for Novell, Inc.'s Netware 386.

The product brings client/server functionality to existing Ashton-Tate Corp. Dbase and compatible files under the Netware 386 network operating system. It performs up to 15 times faster than competitors in report generation, according to Extended Systems.

Extendbase costs $395. Front-end drivers are available for Dbase, Lotus Development Corp.'s 1-2-3 and a Query Processor format.

Extended Systems
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

Modems

Microcom, Inc. has developed the QX/4232bis modem.

The product incorporates support for the company's Microcom Networking Protocol 10, ensuring error-free communications, the company reported. The modem dynamically controls transmission rates depending on the amount of line interference.

The QX/4232bis modem costs $999.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000

Micro-to-host

Eicon Technology Corp. has created Access/Light, a 3270 emulator software package for personal computers. The product requires less than 80K bytes of memory.

Access/Light is included as a component of the company's full-featured Access for DOS (3270) emulator product. Access/Light offers 3270 host connectivity over Novell, Inc. Netware and Netbios local-area networks and supports up to nine simultaneous sessions.

The full Access for DOS (3270) package costs $195. A 25-user license costs $2,500.

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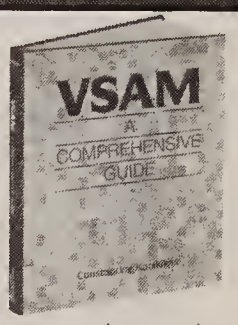

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THE CEO VIEW

Information sharing is vital for smooth sailing

W. B. Seaton, American President Cos.' chairman and CEO, says U.S. firms should emulate the Japanese and treat information as a valuable resource

BY JEAN S. BOZMAN
CW STAFF

As chairman and chief executive officer of $2.3 billion American President Cos. in Oakland, Calif., W. B. "Bruce" Seaton, is counting on computer power to compete with the foreign shipping firms that dominate trans-Pacific shipments between the Far East and North America.

Out on the Pacific Ocean, operating subsidiary American President Lines' 23 company-owned vessels and 12 chartered ships carry 100,000 shipping containers. All ship movements, as well as the locations of cargo, are tracked by computers, which range in size from Apple Computer, Inc. Macintoshes to IBM mainframes. There are some 7,000 computers in use at American President — outnumbering the 5,100-employee work force.

Information management became even more critical last year, when a slowdown in business, followed a major capital-expansion program that paid for ships, computers and railcars, giving the firm a $60 million loss in 1990. Seaton had to reorganize the ranks of American President Lines management and moved corporate offices from one building to another.

Seaton's executive suite does not include a personal computer, but only steps away, electronic messages from American President Lines' Pacific Rim shipping offices arrive all day on a Macintosh. Seaton also has a PC in his home to read and send messages during evenings and weekends.

Following the recent reorganization, Seaton made information sharing a top corporate priority, as he discussed in a recent interview with *Computerworld*:

On using computer technology for a competitive edge:
"I don't think you can maintain a competitive advantage with computer assets anymore. You can innovate with assets, but the world is moving toward standards. The idea is to grow your business economically.

"In the long run, you differentiate yourself [from the competition] with culture, with how you run your business and how your people run your business. The Japanese have developed a business culture that is all about serving the customer, beginning with quality initiatives 30 years ago. Most American companies have had five to 10 years of focusing on a quality program, if that."

On the way Japanese companies share information:
"The Japanese deal with information much more as a resource than Americans do. They can pass it up and down the organization without the emotional hindrances we have. Relatively junior managers can send messages to the president of the company, and he will send an answer right back down to them. That would be revolutionary in America.

"Americans tend to personalize the information. The Japanese ask who needs the information to get the job done. The flatter the organization gets, the less the inhibitions are about sharing information. We've flattened out a little bit, and we've taken some layers out of the organization.

"We have also begun a quality initiative program, which is in its third year. Recently, we added an employee-suggestion program. I once asked a Toyota executive how long it takes Toyota to respond to an employee suggestion, and he told me it took an average of 30 days. That's very, very quick. He also said that Toyota accepts 90% of all suggestions. That's a continuous improvement process."

On the development of computer applications:
"The thing that has bugged me is the basic process by which applications development is a handoff. The information resources people have to become much more involved in the business. If you spit out a lot of information you don't need, it has a cost associated with it.

"We're almost going to have to have a new generation [of U.S. business managers] come in who see that we have to use information as a team effort. Some people have a false impression that programmers are sitting in their niches and are not talking to the users. But I have found that the programmers feel a sense of accomplishment when they put an application out and it's great.

"Some users say they don't have the time to define their information needs. But my feeling is that people have to understand that information is a resource that has to be managed. We put $500,000 into an application, or tens of millions of dollars into applications over the years, and then people say they're not getting a return on that investment. An element that is not considered is whether you can do without that application. If the competition is doing it, and the user is demanding it, it should be done."

On return-on-investment expectations for computer expenditures:
"When people talk about the lack of return on computer equipment, they forget to look at what their alternatives are. We couldn't live today doing everything on a manual basis. You'd have to have 5,000 clerks, and the information would come out six months late."

On communicating with the information systems staff:
"We try to keep each other clued in. I see [the company's chief information officer] Jim Marston every day. Then I meet with 10 to 12 information resources people at a time during roundtable sessions. The meetings include programmers, analysts and computer operators. This is where I've found that there's a tremendous desire on the part of the information resources people to put out work that is wanted by the [internal] customer and is considered useful. You have to develop the process by which that happens."

Cindy Charles

The CEO: *Bruce Seaton, 66, earned a bachelor's degree in business administration from the University of California at Los Angeles in 1949; he served as a U.S. Navy officer in World War II.*

The career: *Chairman of the board of directors and CEO of American President Cos., 1983-present. President and chief operating officer of American President Lines when it was a subsidiary of Natomas Co., 1977-1983. Other senior management positions at Natomas, Occidental Petroleum Corp. and Douglas Oil, a Los Angeles-based subsidiary of Continental Oil Co.*

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INSIDE

▶ Downsizing saves money but can leave you with more Cobol programmers than you need. Page 62.

▶ Calendar. Page 64.

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COMMENTARY

Mary E. Scott

A downside of downsizing

Are you frustrated by the skills gap — or gulf — that's stalling your company's ability to leverage new technology fully? There's no quick or easy fix to having a mismatched technical skills base.

As companies standardize on PC and workstation technology to support their business direction, primary work-force skill requirements shift to such graphical user interface environments as Microsoft Windows, OS/2 or X Windows under Unix, with programming experience in C or the emerging C++ object-oriented development language. But many large companies that are downsizing from a mainframe environment are staffed with hundreds or thousands of Cobol programmers. And there's no magic wand to wave over an existing work force to transform what you have into what you need.

What about retraining, you ask? Yes, retraining selected employees in new technology may offer a partial solution to the skills gap. I say "selected" and "partial" because I simply don't agree with the training gurus who promise to convert all your mainframe programmers into bleeding-edge PC workstation technology experts. There's also the issue of attitude. Simply put, not everyone wants to abandon familiar skills honed over a number of years.

Nor are software development tools, often geared toward end-user applications, a panacea for the skills shortage. Some sad but wise systems managers have learned that while these tools can reduce the applications development effort, it is often at the expense of software performance and efficiency.

Many companies are still woefully unaware of the sea change going on in terms of what skills they really need. Jeff McGroary, president of The Aristos Co. in West Hartford, Conn., an OS/2 and Windows applications development firm, tells of meeting a recently hired C programmer.

"Apparently, the hiring manager didn't fully understand the technical contribution his new hire could make to their shorthanded workstation project team," McGroary said. "He had sent his new staff member to Cobol coding school because that's what everyone had always done."

What about finding the required skills set outside company walls? That's easier said than done. Individuals highly skilled in emerging technology are in short supply and command salaries that reflect the demand. As downsizing gains momentum, competition for experienced talent is emerging from all quarters: major corporations, software development houses, consulting firms and contracting body shops.

Firms that decide to develop a "grow-your-own" entry-level staffing program to build the technical skills pipeline encounter several challenges as well. One company representative recently told me that in order to fill entry-level staffing needs, he was going to find some universities that offer degrees in new technology. I wished him luck. Although some colleges expose students to emerging skills, such as CASE tools, it's far more likely that recent graduates will have studied Pascal — or learned to program on a Macintosh — rather than having developed the specific technical tools in use at a particular company.

Some companies recognize that colleges aren't in the vocational training business and focus on identifying and selecting students who have the capacity to be trained in new skills. Even in those companies, there is a critical need to communicate that message throughout the systems management team.

What's the solution to all this gloom and doom? I recommend working with your company's systems recruitment management to design a strategic staffing plan that matches skills needs — both immediate and long-term — with specific strategies to fill those needs.

As a model, consider the partnerships forged in the 1980s with business unit staffs as companies decentralized applications design and development to user departments. Successfully addressing the skills gap requires the same collaborative effort — but this time, with recruitment staff.

The development and implementation of a company-specific strategic staffing plan requires a serious commitment from systems and recruitment management. It's a time-consuming process that requires a thorough, objective analysis of the human resources implications of business and technical direction, and implementing the resulting recommendations may cause considerable internal upheaval.

But it's worth the investment as well as the pain. As many companies struggling with the skills gap are discovering, having access to emerging technology isn't the strategic advantage. Having a staff that is able to exploit technology is what makes the difference.

Scott, former director of staffing at Aetna Life & Casualty, is president of M. E. Scott & Co., a West Hartford, Conn., college recruitment consulting and training firm.

1975 *Launched the first U.S. public data network.* 1979 *Built the first commercial private packet network.* 1980 *Introduced the first major public e-mail service.*

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1988 *Sprint completes the only nationwide 100% digital fiber optic network. Sprint awarded 40% of FTS 2000 contract.* 1989 *World's first and largest privately-owned*

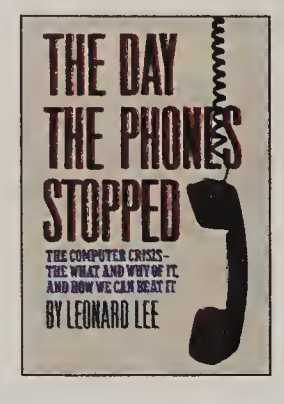
BOOK REVIEWS

Telephone terror in tedious detail

The Day the Phones Stopped
By Leonard Lee
Donald I. Fine, Inc., $18.95

Reading this book is like watching sequels to *A Nightmare on Elm Street*. Even those who enjoy being scared may find that the story gets old long before the final chapter.

Leonard Lee presents a very long list of disasters and problems precipitated by software bugs. The book's title, for instance, refers to AT&T's massive long-distance outage on January 15, 1990. The breakdown stemmed from errors in the company's new switching software, costing AT&T an estimated $75 million in revenue and blocking 70 million attempted long-distance calls nationwide.



Other software-generated calamities include false arrests and radiation burns.

Credit is due for Lee's thorough reporting, and the problem he documents is unquestionably serious. More and more critical functions, such as flight controls for airplanes, are partially or fully controlled by software, and it is impossible to pretest all the combinations of events that plane-flying software will encounter in actual use.

Unfortunately, the chronicle of disasters becomes repetitive to the point of tedium. The writing contributes to the monotonous feel: Readers may amuse themselves by counting the number of paragraphs that begin with "But . . . ," a construction that appears on almost every page. The text also flip-flops between present and past tense in some chapters.

Lee works in some suggestions for overcoming the "computer crisis" of dangerous software errors. Key among them is that many problems can be averted if operators do not complacently trust computers to always render accurate decisions. Readers, however, may choose not to wade through the whole ocean in search of a few small pearls.

DEREK SLATER

Job Search for the Technical Professional
By David J. Moore
John Wiley & Sons, Inc., $14.95

Technical professionals on a job hunt will inevitably fare better in their searches if they adopt some practices from their general business compatriots. While a strong technical background is extremely helpful, it is not always enough. Job candidates also need to know how to sell themselves to prospective employers.

The book discusses the soft topics related to job searches, including the need for building good language skills, maintaining self-esteem and the use of body language, but also gets down to hard details such as knowing what kinds of information to include on a resume, how to develop a technical job search network, how to assess job offers properly and how to reject offers.

Job Search for the Technical Professional is clearly written in easily digested chapters and contains useful anecdotal information and examples. While much of the book is commonsense information, nearly anyone diving back into the job search process can use this kind of easy-read refresher. The book also contains a helpful list of recommended reading for job seekers.

ALAN J. RYAN

Japan's Software Factories
By Michael Cusumano
Oxford University Press, $35

Professor Cusumano's book documents a fundamental change in how future software systems will be developed: They will shift away from craft-oriented development to a more systematic approach that organizes production resources for improved efficiency. "Software factory" is the term that applies to such a systematic approach.

While some of the concepts for software factories originated in the U.S., it is the large Japanese technology companies that have made these concepts work. The book describes how the Japanese succeeded, and it outlines the challenge to the U.S.

Empirically oriented readers will find the book's approach a refreshing contrast to books by other computer and management "experts." Cusumano's conclusions are based on quantitative and qualitative field data rather than anecdotes and opinions.

The field data, collected from surveys, measured three main areas important to the success of software projects: management, product and customers.

The book's major points are explained in a manner that requires no specialized knowledge beyond a passing familiarity with computer software terminology. While the entire book, including appendixes, notes and index, fills 500 pages, the main conclusions and insights are contained within the first 115 pages.

JOHN S. MORRISON

Morrison is with Technology Transfer International Inc. in Colorado Springs.

1985 *Sprint introduces the world's first VPN.℠* 1986 *First transcontinental fiber optic call transmitted by Sprint.* 1987 *Eight million FONCARDs℠ distributed in first year.*

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transatlantic fiber optic cable completed. 1990 *Sprint announces the first commercial video services to the Soviet Union. Sprint introduces first nationwide ISDN capabilities.*

MANAGEMENT SHORTS

Megabank management selected

The score is **Bankamerica Corp.** 4, **Security Pacific Corp.** 2 on the top management team selected by information systems chief Marty Stein to run systems in the merged megabank. Security Pacific choices are Ianne McCrea heading corporate systems and Bill Chenevich heading technology and telecommunications — the latter brought in over Bank of America Senior Vice Presidents Peter Hill and Joe Ervin. Bank of America execs remaining as heads of their current areas are Bruce Fadem, retail automation services; Bill Ott, wholesale automation services; Dave Lynch, field services; and Alan Koch, finance.

Andersen Consulting and **Systematics Financial Services, Inc.** can be considered competitors in the outsourcing business, but they have teamed up in a strategic alliance targeting the financial industry.

The pact intends to offer both "quick interim solutions" and more long-term strategic assistance to clients, Andersen's William E. Storts said. Storts and Systematics Executive Vice President Donald B. Hatfield will jointly oversee the relationship.

A glimmer of economic recovery hope came through in the most recent quarterly survey of U.S. firms' hiring intentions conducted by Milwaukee-based **Manpower, Inc.** Of the more than 15,000 firms surveyed, 21% said they plan to increase hiring in the fourth quarter of this year, compared with 12% who plan to reduce their work forces. Sixty-four percent said they would remain at present levels, and 3% said they were unsure.

Although the so-called plus factor of 9% is down from a plus factor of 12% for the third quarter, it is less of a seasonal drop than would normally be expected. Hiring is usually slowest in the fourth quarter in most industries, with wholesale distribution and retail being the major exceptions.

Wholesale/retail reported a plus factor of 19% for the quarter, with 29% increasing hiring and a rather surprising 10% planning to cut back for the holiday season. Other strong industries were nondurable goods manufacturing with a plus factor of 11%, services at 9% and durable goods manufacturing at 8%.

Public administration showed the only negative factor, with 19% planning cutbacks and 12% intending to increase hiring. The mining and construction industries each showed a factor of zero, with equal numbers of firms planning additions and reductions.

Regionally, the Northeast will continue to struggle with 3% more firms planning cutbacks than those adding workers. The Midwest and South had plus factors of 12% and the West had a plus factor of 7%.

The **American Bankers Association**'s (ABA) annual convention Oct. 5-8 in San Francisco will include a session on "insourcing" of data processing by small community banks. The session, presented Oct. 5 by Hal Stringer at Peerless Systems, Inc., will examine case studies of three community banks that improved their competitive position by insourcing. The ABA is based in Washington, D.C.

The Association for Computing Machinery (ACM) has completed the first phase of its effort to make ACM technical programs available to computer professionals in Eastern Europe. ACM intends to establish chapters in each Eastern European country and hold a series of technical conferences in the region. ACM and Siggraph cosponsored a computer graphics conference in Moscow in February that drew 2,000 Soviet computing professionals.

CALENDAR

The practical application of decision support systems and executive information systems will be the focus of a two-day seminar sponsored by Decision Support Technology, Inc., Nov. 4-5 in Cambridge, Mass.

Seminar leaders include Peter G. W. Keen of the International Center for Information Technologies, Jack Rockart of the MIT Sloan School of Management and C. Lawrence Meador and David Ness of Decision Support Technology.

For more information or to register, contact Decision Support Technology in Cambridge, Mass., at (617) 354-6400.

OCT. 20-26

Sixth Annual Strotegic issues Canference. Cambridge, Mass., Oct. 21-22 — Contact: Decision Support Technology, Inc., Cambridge, Mass. (617) 354-6400.

Comdex/Foll '91. Las Vegas, Oct. 21-25 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Knawledgeshore '91. Orlando, Fla., Oct. 20-24 — Contact: AI Corp., Waltham, Mass. (617) 891-6500.

APICS Internotionol Canference and Exposition. Seattle, Oct. 20-25 — Contact: APICS Meetings Registration, Falls Church, Va. (703) 237-8585.

Rebuilding far Softwore Automation with the 4 R's of CASE. Atlanta, Oct. 21-23 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Alex. Brown & Sons, inc. 12th Annual Technalagy Seminar. Baltimore, Oct. 21-23 — Contact: Lorri Bresnick, Alex. Brown & Sons, Baltimore, Md. (301) 727-1700.

Systems '91. Munich, Germany, Oct. 21-26 — Contact: Gerald Kallman, Kallman Associates, Ridgewood, N.J. (201) 652-7070.

informotion System Security Symposium. Toronto, Oct. 22-23 — Contact: Datapro Canada, North York, Ontario (416) 496-3131.

Cimdex. Detroit, Oct. 22-24 — Contact: Dan Belmont, Cahners Exposition Group, Stamford, Conn. (203) 352-8372.

Deloware Vailey DB2-SQL/DS Users' Group. Essington, Pa., Oct. 23 — Contact: Jean Tucker, Scott Paper Co., Philadelphia, Pa. (215) 522-6294.

Natianol Associotion af Camputer Consulting Businesses. Acapulco, Mexico. Oct. 23-26 — Contact: Creative Conferences, Houston, Texas (713) 871-8773.

Enhonced Network Service Customer Premises Equipment: Defining the Future. Nashville, Oct. 24-25 — Contact: Research First Consulting, Inc., Birmingham, Ala. (919) 687-0908.

EDI User Group Meeting. Atlanta, Oct. 24-25 — Contact: Uniform Code Council, Dayton, Ohio (513) 435-3870.

13th Annuoi Computer Low Institute. New York, Oct. 24-25 — Contact: Practising Law Institute, New York, N.Y. (212) 765-5700.

Losers in Grophics/Electronic Design in Print (LIG/EDP). Tarpon Springs, Fla., Oct. 26-31 — Contact: LIG/EDP, Vista, Calif. (619) 758-9460.

OCT. 27-NOV. 2

Repositary AD/Cycle Internotionol Users Graup. Chicago, Oct. 27-30 — Contact: Repository AD/Cycle International Users Group headquarters, Chicago, Ill. (312) 527-6666.

Building the HRM Doto Modei. Arlington, Va., Oct. 28 — Contact: Association of Human Resources Systems Professionals, Dallas, Texas (214) 661-3727.

The Hammer Re-engineering Conference. Boston, Oct. 28-30 — Contact: Hammer Forum, Cambridge, Mass. (617) 354-5555.

Electronic Messoging '91: Toking Core of Business. New Orleans, Oct. 28-30 — Contact: Electronic Mail Association, Arlington, Va. (703) 875-8620.

CMC '91 ond A/E/C Systems. Nashville, Oct. 28-31 — Contact: Kelly Baxter, A/E/C Systems, Chadds Ford, Pa. (215) 444-9583.

Symposium '91. Lake Buena Vista, Fla., Oct. 28-Nov. 1 — Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

1991 Morketing Conference. New York, Oct. 29-30 — Contact: The Conference Board, New York, N.Y. (212) 339-0290.

Unix Expo Internotianol. New York, Oct. 30-Nov. 1 — Contact: National Blenheim Expositions, New York, N.Y. (212) 391-9111.

CD-I One Canference and Exhibition. Los Angeles, Oct. 31-Nov. 1 — Contact: Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

IS Farum: Technoiogy for the '90s. Fremont, Calif., Nov. 1 — Contact: Jay Kamlani, Jay Mark Applied Systems, Inc., Fremont, Calif. (415) 651-6030.

NOV. 3-9

User Services Conference. Seattle, Nov. 3-6 — Contact: Sheryl Burgstahler, University of Washington, Seattle, Wash. (206) 543-0622.

American Gos Assaciotian/Edison Electric Institute infarmotian (EEI) Systems Canference. Los Angeles, Nov. 3-6 — Contact: Jeffrey Kirstein, EEI, Washington, D.C. (202) 508-5433.

Aspenwarld '91. Cambridge, Mass., Nov. 3-6 — Contact: Aspen Technology, Inc., Cambridge, Mass. (617) 497-9010.

12th Annual Dota Troining Conference & Expositian. Atlanta, Nov. 3-7 — Contact: Conference Department, Boston, Mass. (617) 542-0146.

Assaciotian for Services Monogement (AFSM) internatianol's Eighth Annuol Senior Executive Conference. Edinburgh, Scotland, Nov. 4-6 — Contact: AFSM International, Fort Myers, Fla. (813) 275-7887.

Infotech Monogement Conference & Exposition. New Orleans, Nov. 4-6 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Voice '91/Foll. New York, Nov. 4-7 — Contact: Voice '91/Fall, Houston, Texas (713) 974-6637.

Downsizing/Rightsizing Corporate Computing. Washington, D.C., Nov. 4-7 — Contact: Todd Langton, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

C-Forum '91. Boston, Nov. 4-8 — Contact: The Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

Texos Arc/Info User Group. Denton, Texas, Nov. 4-8 — Contact: Scott Sires, Texas Arc/Info User Group, Denton, Texas (512) 475-0334.

Entity Modeling: Techniques and Applicotions. Houston, Nov. 4-8 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

The Moc Shaw. King of Prussia, Pa., Nov. 5-6 — Contact: Ad-Libs Advertising, Dresher, Pa. (215) 540-9111.

Scan Tech '91. Dallas, Nov. 5-7 — Contact: Automatic Identification Manufacturers USA, Pittsburgh, Pa. (412) 963-8588.

Braadband Networks. Washington, D.C., Nov. 5-8 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Canodion informotian & imoge Management. Toronto, Nov. 6-7 — Contact: World Access Corp., Wellesley Hills, Mass. (617) 235-8095.

Fourth Annuol Micraprocessor Forum. Burlingame, Calif., Nov. 6-7 — Contact: Microprocessor Forum, Berkeley, Calif. (510) 549-4300.

DB2 Detoll Conference. New York, Nov. 6-7 — Contact: George Coronado, DB2 & SQL Users Group, New York, N.Y. (212) 866-7563.

Londex'91. Atlantic City, Nov. 7-9 — Contact: Local-area Network Dealers Association, Elmhurst, Ill. (708) 279-2255.

NOV. 10-16

Shore 77.5. Pittsburgh, Nov. 10-13 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

American institute of Certified Public Accountants (AICPA) Software Users' Conference. Orlando, Fla., Nov. 11-13 — Contact: AICPA, New York, N.Y. (212) 575-6200.

Cols Expo '91. Phoenix, Nov. 11-14 — Contact: National Security Association, Washington, D.C. (202) 775-1440.

North Americon Telecammunicotions Associotion Unicom '91. Washington, D.C., Nov. 11-14 — Contact: Allan M. Olbur, Comserv, Inc., Glenview, Ill. (708) 657-9000.

Windows. Boston, Nov. 11-15 — Contact: The Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

Northeost Computer Show. Boston, Nov.13-15 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

LAN/WAN Support Forum. Washington, D.C., Nov. 13-15 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Imoge Compression Conference. San Jose, Calif., Nov. 14-15 — Contact: BIS Strategic Decisions, Woburn, Mass. (617) 893-9130.

The X Windaw Systems Farum. Boston, Nov. 14-15 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Cyber Arts. Pasadena, Calif., Nov. 14-17 — Contact: Cyber Arts, Cupertino, Calif. (408) 446-1105.

PC Expo. Chicago, Nov. 15-17 — Contact: Annie Z. Scully, Bruno Blenheim, Inc., Englewood Cliffs, N.J. (201) 569-8542.

NOV. 17-23

Guide 81. New Orleans, Nov. 17-22 — Contact: Guide, Chicago, Ill. (312) 644-6610.

Multimedio Expo. San Jose, Calif., Nov. 18-20 — Contact: American Expositions, Inc., New York, N.Y. (212) 226-4141.

USA/East Africa Expa '91. Nairobi, Kenya, Nov. 18-20 — Contact: World Access Corp., Wellesley Hills, Mass. (617) 235-8095.

Data Entry Management Assaciation's (DEMA) 15th Anniversory Conference & Exposition. Dallas, Nov. 18-20 — Contact: DEMA, Norwalk, Conn. (203) 846-3777.

C++ At Wark. Santa Clara, Calif., Nov. 18-22 — Contact: Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

Mapping the Future of Computing and Communicotions. San Francisco, Nov. 19-20 — Contact: Lucy Kehoe, Northeast Consulting Resources, Boston, Mass. (617) 859-0859.

The Omni User Conference. Oak Brook Terrace, Ill. Nov. 20 — Contact: The Omni User, Oak Brook, Ill. (708) 953-6312.

User Allionce for Open Systems. Reston, Va., Nov. 20-21 — Contact: Ed Albrigo, Corporation for Open Systems, McLean, Va. (703) 883-2700.

Computer Publishing. New York, Nov. 22-24 — Contact: Joan Barnett, Conference Management Corp., Norwalk, Conn. (203) 852-0500.

ftware guarantees

id you know there is no way to prove that cal software will always do what it's supposed to do?

ace shuttles, the national telephone switching network and the heating system in your office building are all getting too complicated to leave to the control of mere mortals. Computers are rapidly taking over functions in these areas. However, what happens when a bug causes such systems to go haywire? The quaint term "bug" takes on a sinister aspect when you consider what could happen if software in a nuclear power plant, space shuttle or telephone network were to malfunction.

Failure of redundant on-board computers to talk to one another properly because of software problems has grounded the space shuttle on several occasions. Aggressive heating during the summer, elevators with minds of their own and clocks running on Ukrainian time are a great source of amusement to workers in "smart" office buildings.

A single error in one line of an AT&T communications program caused nine hours of national long-distance telephone chaos in January 1990. And when the Darlington Nuclear Generating Station, sitting 70 km east of Toronto, goes on-line next year, it will be the first to have its emergency shutdown systems controlled by computers, which are in turn controlled by software.

Vital software

This is not to minimize the importance of good software in your accounts receivable system. If something goes wrong there, the consequences can certainly be damaging to the business. However, in the above cases, the stakes are significantly higher.

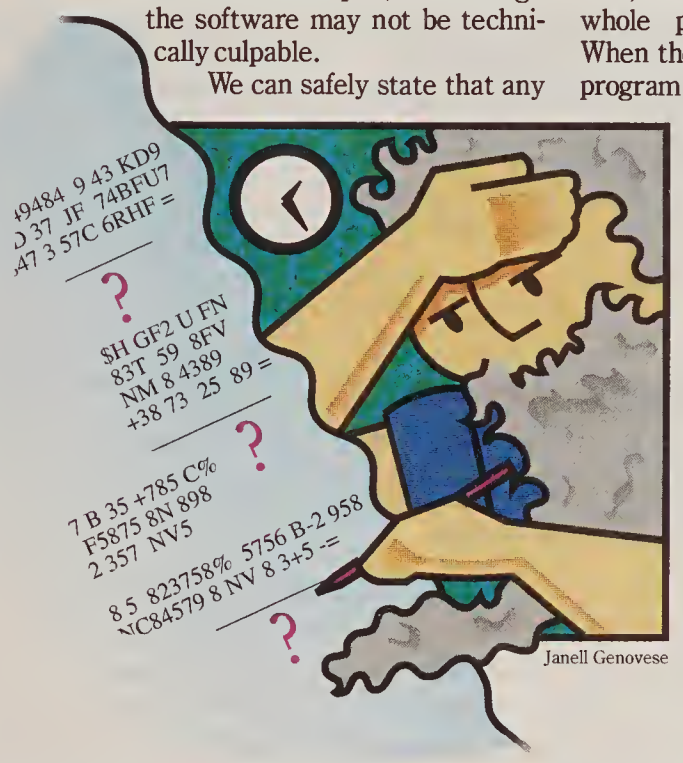
Because of such actual and possible mishaps, organizations with mission-critical software have focused much attention of late on the "provability" of the "correctness" of software. Unfortunately, they are finding that there may not be such a thing.

Stated simply, the goal of "proving correctness" is to be able to state definitively that a complex piece of software does what it is supposed to do. This goal does not normally take into account hardware errors but rather assumes that the host hardware is functioning correctly.

I do not believe any moderately complex piece of software will ever be proven correct in the technical sense of the term. In a more theoretical sense, even a simple piece of software cannot be declared correct in such a fashion that its operation is guaranteed.

While one can argue that such a guarantee is practically plausible, it comes with a host of assumptions that are easily violated (see story page 66) and which, in real-world applications, could lead to catastrophe, even though the software may not be technically culpable.

We can safely state that any program that compiles is perfect in that A) it does exactly what the lines of code say it is going to do, and B) it is perfectly self-documenting. This idea is one of the great beauties of both programming and mathematics.



Janell Genovese

What a program can never tell us is what it is *supposed* to do. Some programs have comments to that effect, but these comments are not really part of the program and are in fact skipped by the compiler. As of yet, there is no technique available for translating the abstraction of a real-world intention into a compilable statement of machine execution — and there likely will never be.

It would seem to be a relatively simple matter to thoroughly describe what we want a program to do. What we will find ourselves doing, however, is developing this description in retrospect, depending on how the program actually behaves. Furthermore, we will find ourselves doing so in computer terms.

The other thing we do is prove the program by running it to see what goes wrong, then fixing it and running it again. We try very hard not to introduce new errors, but we usually do, and these not infrequently result in what is known as the "ripple effect," whereby the new error has an insidious habit of manifesting itself in places we thought would be unaffected. We then fix these errors, thereby introducing others, and the whole process continues merrily along. When the last error we can find is gone, the program may in fact be perfect, but we haven't proven anything.

Aside from this situation, which is familiar to all programmers, there is a more subtle one. Empirical correctness (assuming it is correct because it works as it is supposed to based on experience and observation) is not proof but chance.

The basic probability theory tells us that the likelihood of a program being correct increases with successive iterations of successful operation. However, it tells us nothing about whether our testing methods are exhaustive. (Note that proving a successful test is exhaustive is the mathematical equivalent of proving the software correct.) Add in the multiplicative effects of several programs interacting and the probability of exhaustive testing is vanishingly small.

Nonempirical proof

So the current trend is to try to find ways to "prove" correctness without resorting to empirical demonstrations of the increasing likelihood of correctness.

Now we have a situation in which we try to use a proof extrinsic to the actual code. Because the actual code in the context of a host environment is demonstrably the most precise definition of a program that can possibly exist, no extrinsic proof can be definitive. To be definitive, it would have to be more precise than the program, and this is not possible. Any attempt to use the code itself, or even portions, would be self-reflexive

Continued on page 66

Gruenfeld, a former management consulting partner at Deloitte & Touche, lives and writes in Los Angeles.

- **Experience and observation are not proof**
- **VIPER not proven bug-free**
- **A problem for you to solve**

Continued from page 65

and would lead to unacceptable tautologies.

Mathematicians will recognize this as a variation of Godel's theorem, which essentially says no closed system can prove all of its own statements without going outside the system. "This statement is false" is the classic example.

Another way of stating the dilemma is as follows: To prove a piece of software, you must first precisely define its intended operation, then prove that this intent is carried out under all possible conditions. The only truly definitive definition is the program itself; any equally definitive definition would require a language of equal precision, which itself is not proved (by definition).

Because computer code is the most detailed way of stating the intent of the code, the correspondence between the code and the extrinsic definition (the statement of intent) cannot be complete. Therefore, the intent of the program can never be precisely defined. Without such a definition, proof is impossible.

Furthermore, any language capable of defining functionality with greater precision than a computer program is probably more easily compilable than the actual code it is supposed to define. Building that compiler still leaves the problem of proving the definition, which is now itself a program.

This brings us full circle to the original point, with a new variation: Proof is dependent on definition, the veracity of which (in the sense of exhaustion and accuracy) is again not provable without yet another definition, and so forth.

The bottom line is that the proving of a software program is intrinsically unsolvable because it assumes our ability to construct an absolute definition. The degree of completeness of the proof is dependent on the completeness of the definition, which cannot be proven.

An important point here is that mathematically precise definitions are possible. What is not possible is a definition purporting to capture all of the real-world variations of an actual program running on an actual machine.

Taking VIPER to court

This point was recently dramatically underscored by the VIPER project in the UK. VIPER — Verifiable Integrated Processor for Enhanced Reliability — was to be the first commercially available microprocessor to come with the declaration that the correctness of its design is mathematically provable. This claim was so controversial that it actually led to a lawsuit against the British Ministry of Defense alleging that the claim of proof equated to negligent misrepresentation.

Acknowledging that a direct proof of the correspondence between the chip's intended and actual operation was impossible, VIPER's developers sought to establish correctness via a chain of reasoning that proceeded in layered fashion from a top-level specification down to the gate level. This was a monumental undertaking, vastly more difficult than building the chip itself, and as the work proceeded, one of the people who had the task of constructing the proof began to have doubts about how the chip was being portrayed.

What the researcher concluded was that correctness relates only to the chip's performance *according to its formal specifications.* It does not mean that the chip is doing what it was intended to do because the statement of intent and the formal specifications are two different things. The latter is derived from the former and necessarily involves a definitional abstraction for which even the VIPER researchers were unable to provide a mathematically exhaustive link.

As it turns out, no bug has ever been found in the exhaustively tested VIPER chip. It is a marvel of cybernetic purity and can comfortably and practically be said to be bug-free. What cannot be said is that it has been "proven" to be bug-free.

Does this mean we should give up? In a sense, yes. The search for a rigorously defensible proofing mechanism may be disappointing. It would require so many constraints on the actual construction of programs as to render them practically useless. Their only remaining utility would be to prove that they work.

A better approach may be to acknowledge the primacy of empiricism in the field of software testing and search for ways to streamline the process, maximizing the likelihood of correctness rather than trying to guarantee it absolutely.

A careful look at the methods used to check out the Darlington shutdown software discloses that what went on was a process of definition refinement. One team went through the programs line by line and extracted definitions of what the code was really doing. Another team translated the original specifications into mathematically precise statements. Yet a third team then matched them both up to look for discrepancies.

This review was painstaking, exhausting, labor-intensive and costly. It took three years. The people involved, upon later reflection, realized that one of the biggest problems in testing software is that software is generally not built to be tested. They are working on new standards that are analogous to the trend in manufacturing toward designing ease of construction and maintenance right into the product from the outset. (The Darlington software will be rewritten to reflect these standards.)

This is reminiscent of the development of a very sophisticated military aircraft with the most advanced terrain-following radar and control system ever developed up to that time. Its initial flight tests were flawless, with the control surfaces responding perfectly to every topological nuance. When the plane encountered a sheer cliff wall dead ahead, the system dutifully attempted to follow the vertical face — straight into the ground. Nobody had ever thought of that situation, so nobody had told the software. Technically, however, the program was "correct." •

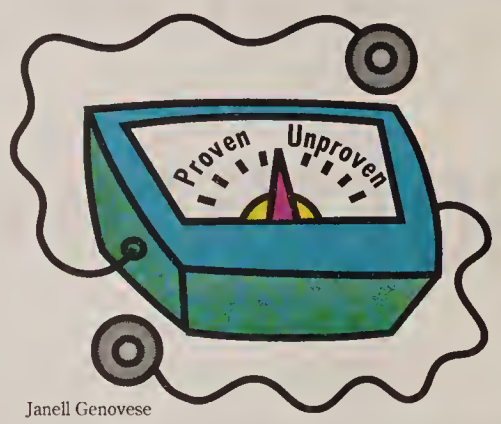
Can you prove this program correct?

To see how tough it is to prove software correct, let's examine a simple program:

Input I
Input J
Add I to J giving K
Output K

Will this program work? Think about it before reading on. Making some hand-waving assumptions about the correctness of the compiler for this language, few people will maintain that this is a flawed program. However, there are a number of very real problems.

The most serious problem with this program is not in the code but in the question, "Will this program work?" Not one of the experienced programmers I asked to examine this code asked what it is supposed to do. They assumed from the program that its purpose is to get two numbers from the user, add them together and display the answer. Thus, we have not established the purpose of the program prior to examining its correctness. In order to prove the code, we must have a definition of functionality that is separate from the code used to express it.



Janell Genovese

This most basic problem seems easily solved. I'll tell you that the program is supposed to add two numbers together and display the answer and now ask you to look at it again. Very likely, it will once again pass the test.

Except that I also need to tell you what kinds of numbers I intended to add. Fortran programmers will recognize I, J and K as default integer types, but this piece of code is not Fortran. These numbers are whatever this compiler defaulted to, and if that foots with my intent, we are all right there. Let's assume they are real numbers.

How big can they be? No problem: This program is intended to add numbers not greater than 255. How about -42 + 58? Well, let's exclude negative numbers, because this piece of code deals with the accumulation of readings from a real-time sensor in a Minuteman missile silo.

We seem to be home free . . . unless we add 150 to 150 and overflow K. This will cause us to add error handling code, which is vastly more complex than the original task of adding two numbers together. And what happens if we enter 1.2E2, a normally legitimate rendering of 120 but, as it turns out, one that is not recognized by this compiler?

This program will continue to behave perfectly, as its perfect self-documentation will tell you, but it is less clear that the program will do what we intended it to do.

J.A.S. Technology of the Americas, Limited Announces a Major Breakthrough in the Fight To Identify, Defeat and Prevent Computer Viruses From Infecting Your Personal Computer

"Virus Trap," a patented hardware device, guarantees to prevent the more than 650 known viruses from infecting your IBM/IBM-compatible DOS operating systems and absolutely insures a clean and secure system every time your personal computer is switched on.

- Demonstrations in major U.S. cities, depending upon participation.
- Priority responses to organizations with 2,000 or more personal computers
- Price: $395 per unit

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96 Raider Drive, Warrenton, Virginia 22186
Telephone/Facsimile 703/349-0696

digital™

digital update

THE OPEN ADVANTAGE SEPTEMBER 1991

Print Tough Jobs *FAST*

You have a problem: your PostScript printer can't keep up with the load any more.

Digital has a solution: the new turbo PrintServer 20 *laser printer. Like the other members of Digital's* PrintServer *family, the turbo* PrintServer 20 *system is a network node that supports both TCP/IP and DECnet protocols. Its high-quality, 20-page-per-minute print engine is well integrated with a powerful new computing architecture that gives you five times the CPU processing power of its predecessor, the popular* PrintServer 20. *This state-of-the-art printer can keep up with your work load, no matter how heavy.*

The list price of the turbo PrintServer 20 *system is $19,495. If you already have a* PrintServer 20, *you can upgrade it to a turbo* PrintServer 20 *by purchasing the upgrade kit, list priced at $2,995.*

turbo PrintServer 20

NETWORK PRINTING BUILDS ON NETWORK COMPUTING

If your business is like most today, you rely on network computing to run your operations economically and productively. No doubt you take advantage of the high-speed, high-volume printing available only through network printers.

No matter what your industry, network printers provide the compute horsepower to let many users produce complex documents quickly and with a variety of typefaces and images. When you're purchasing a network printer, these are qualities you naturally expect. You should expect more.

Digital Bundles All Your Requests for Network Printing into One Package

Digital's PrintServer family of fast, powerful network printers has emerged out of our 20-year history of networking. By listening to the demands of customers from without and within, Digital continues to build on this networking experience with the latest PrintServer family member—the *turbo* PrintServer 20 system, which resides on the Ethernet. Like the PrintServer 40 *plus* system, the *turbo* PrintServer 20 system runs the industry-standard PostScript page description language from Adobe Systems, Inc.

The recently announced DEC PrintServer Supporting Host V4.0 software, designed using CASE tools, contains PostScript code merged with 35,000 lines of Digital's code. The software was just rewritten using the industry-standard C programming language with a focus on quality design that included the Six Sigma quality methodologies. These cutting-edge design rules subjected every phase of the project to vigorous specification and review.

Additional Functions at No Extra Cost

Included with DEC PrintServer Supporting Host V4.0 software at no extra charge are value-added capabilities that—if available through other companies—are often sold separately.

Significant enhancements add power and versatility to the management functions in DEC PrintServer Supporting Host V4.0 software. This capability helps monitor usage, for example. Centralized job accounting provides system managers with summaries of PrintServer system usage, tracking usage and costs for each print job.

System managers can now control access to any PrintServer system, by node number and/or node area, through TCP/IP and DECnet. This means that a department paying for a PrintServer system out of its own budget can, if it desires, limit access to that system to the people in its own department.

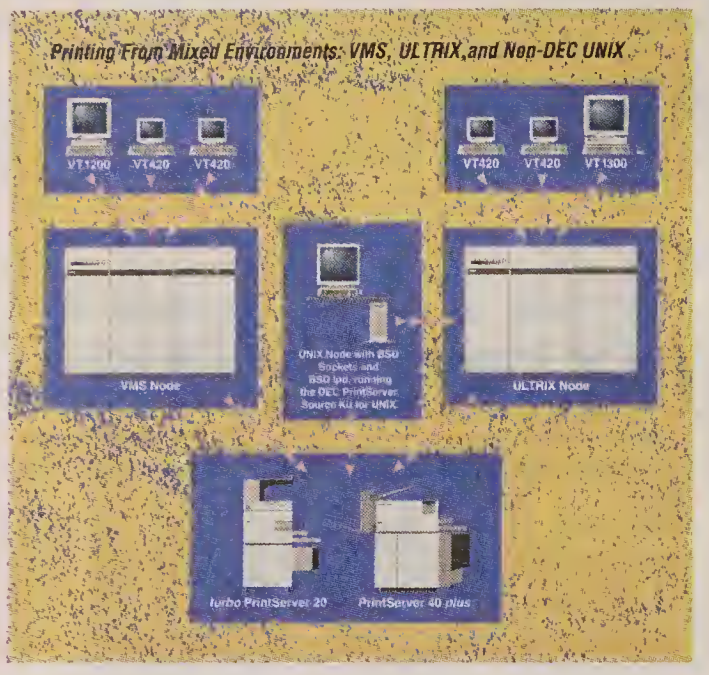
Keeping the Printers Printing, or Not

A remote console for remote management is also packaged in at no additional charge. An interactive user interface, the remote management function runs from a terminal or in terminal-emulation mode on a workstation. This function tells you if the network printer has run out of paper, if someone has come by and stopped it, or if the printer needs a supply, such as toner.

In nonprivileged mode, the remote management function tells you who's ahead in the print queue and whether they're printing from the same machine, or from elsewhere on your network. Useful in a distributed environment, this gives you some idea of when your job might finish.

In privileged mode, a system manager monitoring printing in realtime knows instantly if printing functions are up and running. No other provider of network printers offers anything like this capability.

The remote management function also lets the system manager shut off printer access remotely. This is desirable when the system



Say Open Please

The latest release of DEC PrintServer Supporting Host V4.0 software supports TCP/IP and DECnet protocols simultaneously, so that many types of systems can share the same Digital network printer. Whether you use VMS, ULTRIX, UNIX, MS-DOS, or Apple Macintosh systems, you can access the *turbo* PrintServer 20 or the PrintServer 40 *plus* systems. This is further evidence of Digital's ongoing commitment to open systems. For example, here you see a printing environment from mixed operating systems—VMS, ULTRIX, and UNIX systems that support BSD TCP/IP sockets.

needs to be paused for supply replenishment or to stop printing at the end of the day so that confidential print jobs aren't left unguarded. This facility also allows the privileged user to select defaults and to abort jobs.

Enhanced Image Output, ALL-IN-1 Compatibility, Plus Resource-Loading Text File

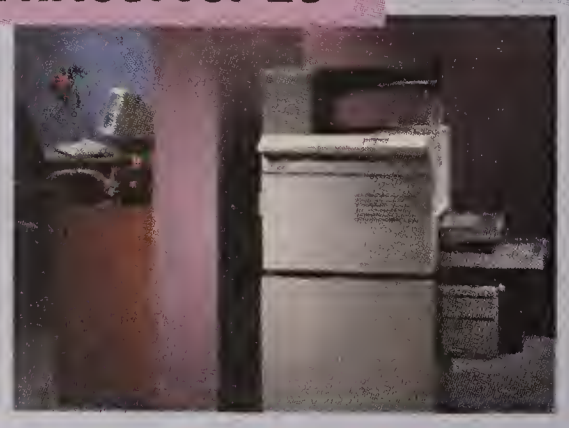
DEC PrintServer Supporting Host V4.0 software generates enhanced image output, with almost photographic quality and clarity. Best of all, this image capability, like the other enhancements, is included in the software at no extra cost.

For added benefit, DEC PrintServer Supporting Host V4.0 software allows full compatibility with Digital's ALL-IN-1 office automation system and provides improved, automated support for resource-loading.

Resource-loading enables you to pre-load the printer with such resources as PostScript logos, PostScript letterheads, and soft fonts. In this new version of software, Digital includes a text-file-driven, resource-loading strategy. The process is easy to follow and fully documented, providing automated, intelligent loading of PostScript resources. In brief, every time the printer boots, the specified resource files are provided to the printer by a file access daemon. So, as far as system users are concerned, these resources are always available to them.

All these features bundled into DEC PrintServer Supporting Host V4.0 software reflect our incorporation of customer requests into software that has been designed according to high-quality standards and high-reliability guidelines. These many enhancements add up to a rich printing system with tremendous flexibility for users and system managers. And that's certainly news worth printing.

turbo PrintServer 20



Seeing Is Believing

Call 800-DIGITAL (800-344-4825), ext. 828 today for a FREE copy of our five-minute videotape highlighting the great features of the *turbo* PrintServer 20. Call the same number for more information about the DEC PrintServer Supporting Host V4.0 software and all our other network printer capabilities. Or contact your local Digital sales representative.

The Proof's in the Printing

The speed of the *turbo* PrintServer 20 was put to the test recently by a major U.S. insurance company interested in Digital's printer products, and MORE interested in a competitor's equipment.

The company compiled a table of performance stats for a HUGE PostScript job—nearly 30,000 VAX disk blocks, hundreds of PostScript output pages with bitmaps, and fonts, plus overlay and underlay pages.

The competitor's printer (with a RISC chip and major horsepower) ran the job at between 5 and 10 pages per minute.

The *turbo* PrintServer 20 ran at 20 pages per minute.

Enough said.

ACE List Gets LONGER

An additional 38 companies have joined Digital and 20 other vendors in supporting the Advanced Computing Environment (ACE) initiative. This widening of membership scope suggests the breadth of global industry involvement in ACE.

New ACE Members

System Vendors:
Adaptec
Altos India, Ltd.
Bruker Analytishe
Bull Micral of America
Corollary, Inc.
CSS Laboratories
Daewoo Telecom, Ltd.
DCM Data Products
DESKSTATION Technology
DuPont Pixel Systems, Ltd.
Epson America, Inc.
Gain System
Goldstar Company, Ltd.
Heurikon Corporation
Itos Computer
Jetfill, Inc.
Lockheed Sanders, Inc.
Megatek Corporation
Micro Computer Systems, Inc.
Parallan Computer, Inc.
Reply Corporation
Research Machines PLC
Ross Systems
Samsung Electronics
Sanyo Electric Company
Set Technology Corporation
SPECS BmbH
Stereo Graphics
Tyan Computers

Software Vendors:
Algorithmics, Ltd.
Banyan
BioSym Technology
CAD Group
Migration Software Systems
Zycad Corporation

Semiconductor Vendors:
Integrated Device Technology, Inc.
LSI Logic Corporation
Performance Semiconductor Corporation

More ACE vendors are soon to be announced. We'll keep you posted.

Service On-the-Go for Laptop Computing

Thanks to our Return-to-Factory Service Agreement, you'll never have to be without your laptop for long.

When your Digital laptop needs repair, just give us a call and ship it directly to Digital. We'll repair the unit in as little as 24 or no more than 48 hours after receipt, then ship it back to you anywhere in the U.S.

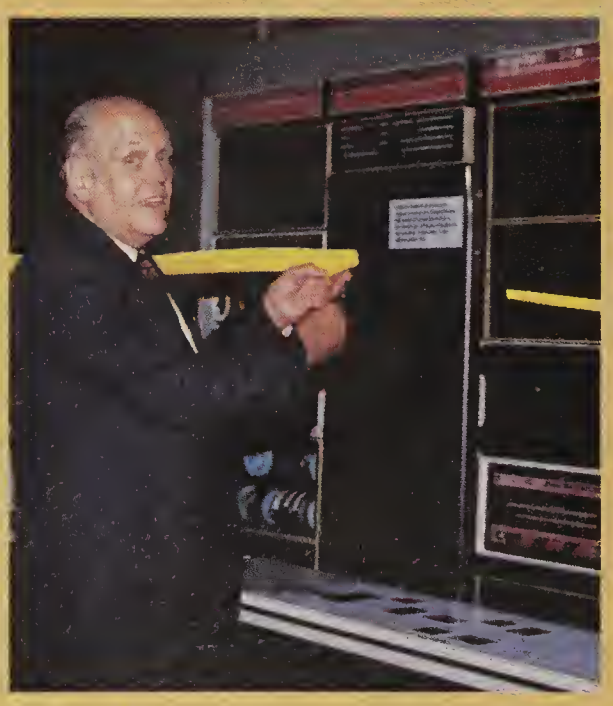
A simple one-time payment covers Digital laptop repairs for one to two years after the warranty expires. Not only is the service fast, but it's also backed by Digital's high standards for quality and reliability.

When turnaround time is even more critical, we can repair and return your Digital laptop computer on the same day for an additional fee. Just ask for our Expedited Service. Then ship the unit to arrive at our dock by noon (E.T.), and we'll return-ship the repaired unit by 5:00 p.m. (E.T.).

Call 800-225-5385 today for more information on how to keep your laptop tiptop.

The PDP-11 Line Keeps On Performing

At the recent dedication of the exhibit commemorating the twentieth anniversary of the PDP-11 computer, Digital President Kenneth Olsen reflected upon the minicomputer's longevity, popularity, and pivotal role in the interactive computer industry. "The PDP-11 computer family is now 21 years old, with no signs of retiring. The basic design has withstood the test of time, and will continue to do so. Demand for the system is still strong. We anticipate that the PDP-11 computer family will be actively marketed years from now," observed Olsen.



WHY WAIT?

From printer ribbons to configured workstations, over 2,000 Digital products are ready to FASTship today.

Having so many products so readily available helps meet the challenge of inventory management.

The selection of workstation and desktop products we're offering as part of the FASTship program just keeps growing, including:

- The DECstation 5000 Model 100 Series, now one of the most upgradable workstation systems available. (Selected Model 120 configurations also available FASTship.)
- Popular VMS workstations, like the VAXstation 3100 Model 38.
- The applicationDEC 433MP, our flagship SCO UNIX system.

Order FASTship Any Way You Choose—All at No Extra Charge

Take advantage of our easy, direct ways to place an order FASTship, or to confirm current product availability:

- Call 800-DIGITAL (800-344-4825).
- Log in to the Electronic Store (800-234-1998 at 1200/2400/9600 baud).
- Fax a DECdirect catalog order form to 603-884-5597.

Order this afternoon, we'll ship tomorrow, and you'll usually have what you need in three to six days. Now that's FAST.

A Good Investment Just Became Better

DIGITAL REDUCES MEMORY PRICES 12% TO 50%

Take advantage of current savings on memory products for a wide range of VAX systems and workstations, plus Digital RISC workstations.

Keep in mind that you pay less per megabyte when you buy larger capacity memory products for VAX 6000 and VAX 4000 Model 300 systems. So it makes good business sense to plan ahead and get the full amount of memory you need.

And remember, more memory means more performance in many applications. During recent benchmarks run on a VAX 6000 Model 510 system, three times more ALL-IN-1 users were supported, with no degradation in response time, when memory was doubled from 64 MB to 128 MB. Increasing memory from 32 MB to 64 MB on a VAX 4000 Model 300 allowed 57 additional users to be supported.

Save 17% to 19% on these memory options for VAX 6000 systems:			
MS65A-CA	64 MB memory	NOW	$54,400
MS65A-DA	128 MB memory	NOW	$96,000
Save 24% to 40% on these memory options for VAX 4000 Model 300 systems:			
MS670-BA	32 MB memory	NOW	$19,200
MS670-CA	64 MB memory	NOW	$30,400
Save 25% on these memory options for VAX 4000 Model 200 and MicroVAX 3300/3400/3800/3900 systems:			
MS650-BB/BH	8 MB memory	NOW	$3,600
MS650-BA/BF	16 MB memory	NOW	$7,200
Save 12% on these memory options for VAXstation 3100 Models 30/40 38/48, MicroVAX 3100 Models 10E/20E systems:			
MS42-AB	4 MB memory	NOW	$880
MS42-KA	8 MB memory	NOW	$1,760
MS42-BA	12 MB memory	NOW	$2,640
MS42-CA	16 MB memory	NOW	$3,520
Save 29% on this memory option for VAXstation 3100 Model 76 systems:			
MS44-AA	4 MB memory	NOW	$1,000
Save 44% to 47% on these memory options for DECsystem 5500 systems:			
MS220-AA	32 MB memory	NOW	$10,800
MS220-BA	64 MB memory	NOW	$20,160
Save 25% on this memory option for DECsystem 5400 systems:			
MS650-BA/BF	16 MB memory	NOW	$7,200
Save 29% to 50% on these memory options for DECsystem 5100 systems:			
MS44-BA	8 MB memory	NOW	$2,000
MS44-DA	32 MB memory	NOW	$8,000
Save 21% to 31% on these memory options for DECsystem 5000 Model 200, DECstation 5000 Model 200 systems:			
MS02-AA	8 MB memory	NOW	$2,200
MS02-CA	32 MB memory	NOW	$8,800
Save 12% on these memory options for DECsystem 5000 Model 100 systems:			
MS01-AA	4 MB memory	NOW	$880
MS01-CA	16 MB memory	NOW	$3,520
Save 12% on this memory option for DECsystem 3100, DECstation 3100/2100 systems:			
MS01-AA	4 MB memory	NOW	$880

For assistance in configuring memory for your systems, or for more information on our special memory programs, call 800-DIGITAL (800-344-4825), ext. 553.

Here's the Scoop on Our New SCSI Disk

Geared to workstation and server systems, Digital's powerful new 426 MB 3.5-inch RZ25 SCSI disk can handle demanding, I/O-intensive work loads as well as applications requiring high data throughput. Features such as dedicated servo systems, higher RPM rates, and variable density recording add up to make the RZ25 one of the highest performing devices on the market today. Note that the RZ25 is fully supported under VMS V5.4-1 and ULTRIX V4.2.

RZ25 Ordering Information Soon Available FASTship

For DECstation 5000 Model 100 Series systems:
Field Installed
Part # RZ25-FL
Factory Installed
Part # RZ25-FM

For DECsystem 5100/ MicroVAX 3100 systems:
Field Installed
Part # RZ25-EF
Factory Installed
Part # RZ25-EG

For applicationDEC 433MP systems:
Field Installed
Part # RZ25-SH
Factory Installed
Part # RZ25-SJ

All versions are priced at $3,500.

Plus 20% Savings on Other SCSI Disks

Digital has reduced prices on the following SCSI disk drives:

RZ Drive	Form Factor	Formatted Capacity	New, 20% Lower List Price
RZ23L	3.5-inch	121 MB	$1,200
RZ24	3.5-inch	209 MB	$2,000
RZ56	5.25-inch	665 MB	$3,900

Price reductions on the RZ56 disk also apply to fixed and removable disk drives, including all SZ12 expansion box configurations that contain the RZ56.

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NATIONAL
BRIEFS

IPOs

▶ Network-based business information software provider **IMRS, Inc.** is going public. In a registration statement filed with the Securities and Exchange Commission earlier this month, the Stamford, Conn.-based firm proposed to sell 1.5 million shares, with an additional 1.4 million offered by current shareholders. Meanwhile, Chicago-based systems consulting house **TSC** filed for an initial public offering of 3.8 million shares at an anticipated price of $15 per share.

Seagate shuffle

▶ **Seagate Technology, Inc.** founder and Chief Executive Officer **Alan Shugart** is now president and chief operating officer as well. Shugart assumed the additional offices and duties following the abrupt mid-month departure of 10-year veteran executive **Thomas Mitchell**. Widely credited with Seagate's rise to disk drive market prominence, Mitchell recently presided over a period marked by sales slides, plant closings and work-force cuts.

Amazing Grace

▶ Rear Admiral **Grace M. Hopper** (USNR retired), who helped program Univac I, the world's first commercial large-scale electronic computer, was one of 18 engineers awarded the National Medal of Technology by President Bush this month. Computer industry pioneer Hopper, the first female individual recipient of what is widely considered the nation's highest technology honor, is currently serving as a senior consultant at **Digital Equipment Corp.** — the firm she joined at age 79.

Critical mass

▶ Sunnyvale, Calif.-based start-up **Crescendo Communications, Inc.** claims that its Copper Distributed Date Interface technology will let the Fiber Distributed Data Interface network protocol run across commonly installed wiring, thus paving the way to products that multiply network operating times at far less than the cost of installing fiber-optic cabling and media. Now the fledgling firm will have a chance to back its words with action: A $5.8 million second round of venture financing, Crescendo said, will allow it to bring its maiden products to market.

Vertical integration driving urge to merge

BY ALEC L. ELLISON
SPECIAL TO CW

A new transaction prototype is emerging on the mergers and acquisitions scene: vertical integration.

Of course, the concept of vertical integration is not new to the computer industry. Vertical integration, simply defined, is the expansion of a firm into the business of its suppliers or its customers. The former is also known as "backward" or "upstream" integration; the latter, "forward" or "downstream."

Until recently, however, firms thought in terms of integrating vertically through internal expansion.

Now, pressed by intensified user demands and even more by the shortened product life cycles, companies are buying rather than building their way into their users' and suppliers' markets.

Technology firms historically have been motivated to merge, to acquire or to invest for one of three reasons: to obtain related products to provide for existing customers; to buy rather than build complementary core technology; or to expand market share and/or geographical presence.

New paradigm

During the past 18 months, however, a new paradigm is appearing in transactions such as those between Texas Instruments, Inc. and James Martin Associates; Ask Computer Systems, Inc. and Electronic Data Systems Corp.; Computer Associates International, Inc. and The Newtrend Group; and IBM and Wang Laboratories, Inc. (see chart).

These combinations are taking myriad innovative forms, including minority investments, joint ventures and multihanded deals as well as "standard" acquisitions. All of them are fueled by a company's urge toward vertical integration.

Relatively few U.S.-based technology companies seek to own their supplies of disks or memory chips the way oil refiners purchase drilling rights or paper manufacturers acquire forests. But many computer firms do require strong end-user relationships, so they forward integrate by building a direct sales channel.

However, a direct sales channel does not fit the business model of many technology firms. Many firms opt instead to employ third-party channels such as systems integrators, value-added resellers and turnkey systems vendors.

Two important developments have required product vendors to reassess their relationships with these channels.

First, an increasing user demand for business solutions rather than technology has moved these service-oriented channels into a position of increasing importance. Second, product proliferation and resulting competitive pressures have exacerbated the challenge of getting the channel's attention.

Unacceptable dependence

Vendors have responded in various manners to this unacceptable dependence on third-party channels. Strategic alliances, marketing agreements — some written, some implied — with integrators and suppliers, are one form the reaction is taking.

However, these tactics may not go far enough in substantially enhancing the company's channel control. For one thing, a spreading web of agreements and commitments can dilute so-called "mind share."

Consequently, some firms are opting for control through direct purchase: either by taking an equity stake in an entity that can serve as a channel for its products or by acquiring such an entity outright.

Witness, for example, the following developments:

- TI's acquisition of James Martin Associates' London-based operations gave TI control of the largest consultancy selling Information Engineering-related computer-aided software engineering products.
- Sybase, Inc.'s acquisition of SQL Solutions, Inc. gave database manufacturer Sybase control of a premier firm selling services to support relational database systems.
- Compuware Corp.'s acquisition of Innovative Staffing provided a channel for Compuware to sell its CICS and IBM DB2 applications.

Minority interests as well as total acquisitions are proving appealing to computer firms in search of channel control.

Take IBM's recent $25 million investment in Wang: While numerous other IBM strategic investments gave IBM access to or influence over the develop-

Continued on page 74

Vertical integration-driven deals: Whodunit?

Several firms to date— and more are likely to come as firms merge, acquire and invest their way into their users' and suppliers' markets

When?	Who and what?	How much?	Why?
1/90	Sybase buys SQL Solutions	Price not disclosed	Gives Sybase control of firm selling services to support relational DBMS systems
12/90	Compuware buys Innovative Staffing	Price not disclosed	Gives Compuware a sales channel for its CICS and DB2 applications
4/91	Texas Instruments buys James Martin Associates' London-based operation	$30M+	Gives TI control of large CASE consultancy
6/91	IBM invests in Wang Laboratories	$25M	Gives IBM a reseller for its hardware
8/91	Hewlett-Packard invests in Ask Computer Systems	$20M	Gives HP influence with major channel to manufacturers

Source: Broadview Associates

CW Chart: Janell Genovese

COURT
REPORT

VI Systems, Inc. was last seen suing not only a competitor — Unicorn Systems, Inc. — that it claims violated VI Systems' technology patent rights but also NCR Corp., for its role as a prospective OEM of the allegedly tainted Unicorn technology, and Burlington Coat Factory Warehouse, Inc., which bought and uses the Unicorn package [CW, Aug. 26]. Earlier this month, VI and NCR resolved their differences out of court: It turned out NCR had never actually entered a contemplated agreement to develop an interface between one of its own software packages and Unicorn's. VI Systems filed suit against NCR in August, following a June press release announcing plans to develop exactly such an interface.

Software toolmaker Cognos, Inc. is among the latest firms to make a federal case out of defending its intellectual property. In a suit filed in federal court in Massachusetts earlier this month, Cognos accused Tymlabs Corp. in Austin, Texas, of violating Cognos' copyrights in its flagship Powerhouse software. Cognos accused Tymlabs of copying several of the attributes of Powerhouse's QDD dictionary and QUIZ report writer to use in Tymlabs' PDQ. To put a stop to the alleged behavior, Cognos is seeking an injunction in addition to a cash damage award.

Amstrad PLC probably does not field a baseball team; however, the UK-based computer maker is demonstrating zeal for the other great American pastime: litigation. The firm is in the process of suing two U.S.-based disk drive suppliers, alleging that product snafus on their respective parts in 1988 and 1989 cost Amstrad multimillions in expenses and foregone sales and damaged its reputation. Seagate Technology, Inc. faces a $150 million suit from Amstrad; Western Digital Corp. faces a $141 million action.

A Western Digital spokesman said the company will vigorously defend itself and is mulling over the possibility of filing a countersuit against Amstrad to recover funds it said it spent to help the British firm out of the binds that Amstrad contends were caused by substandard disk drives. Stay tuned.

Gupta gears up to face growth challenge

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — Gupta Technologies, Inc., a privately held software firm, has reached $20 million in revenue by balancing the desire to grow the business with the determination to maintain its stability.

So far, it has proved a solid strategy. But the coming era of client/server computing — a market for which Gupta, with its wide range of database-centered, end-user-oriented software offerings, seems well positioned — as well as competition from industry giants may be about to put it to the test.

Can Gupta manage fast growth? And is its controlled growth a strategy or a rationale? In the coming months, the answers are likely to emerge.

Founder and Chief Executive Officer Umang Gupta appears to have no doubt that his firm is taking the right tack.

"There are many examples in this business of companies that have had a meteoric rise, then crashed and burned," he said. Gupta said he plans to take the firm public when it reaches the $40 million to $50 million range. "We hope to get to $35 million by next year," he said.

Gupta prides himself on bootstrapping the company with software contracts for larger firms, including Lotus Development Corp. and Computer Associates International, Inc.

In fact, Gupta developed its three key products — the SQLWindows applications development tool, the SQLBase database for personal computer local-area networks and the SQLNetwork micro-to-mainframe connectivity package — with revenue from such OEM contracts.

Once these products hit the market, Gupta turned to venture capital, winning a round of financing in 1988 from Menlo Park, Calif.-based Venrock Associates and Morgan Stanley Group, Inc. A second round came two years later from fellow software player Novell, Inc. As of now, Novell owns nearly 20% of Gupta stock; however, it has no present plan to acquire Gupta, an executive said last week.

Gupta said he plans to increase staff size, now at approximately 150, only in proportion to business growth fueled by cash flow. He said he expects that rate to speed up over the next several years as stand-alone PCs become networked into work groups that require databases and connections to host computers: the kind of complementary software Gupta already offers.

Gupta is determined *to implement controlled growth at his firm*

Shaking off concerns that his company's products are going toe-to-toe with Microsoft Corp.'s SQLServer database, Gupta said he is worried more about competition from Oracle and Borland International, Inc., which are developing LAN database servers.

Gupta's controlled growth strategy appears to be working. "They're in a reasonably stable financial position, since every DBMS vendor is under pricing pressure today," said Herb Edelstein, co-founder of Euclid Associates, a Potomac, Md., consulting firm. "Umang Gupta has been very smart and controlled.

"The question is, has he been too conservative in his rate of growth?" Edelstein added. Gupta could be rocked by heavy pressure from $239 million Borland, which is acquiring the Interbase relational DBMS through its pending acquisition of Ashton-Tate Corp. "Borland is going to compete on the database engine side," Edelstein said. "They're coming after everybody, from Oracle to Sybase to Gupta."

Meanwhile, through a series of alliances, Gupta has a greater impact on the LAN market than the firm's size might imply. It has marketing relationships with computer industry giants Novell, IBM, Mitsubishi Corp. and Siemens AG, for instance. Gupta is also developing Unix-based database servers for NCR Corp.'s Cooperation series of client/server software.

At the moment, independent software vendors account for some 70% of Gupta's user base. But the firm is also going after high-profile end-user accounts: It currently counts Citibank, Arco Oil and Gas Co. and J. P. Morgan & Co. among its biggest customers.

J. P. Morgan's Morgan Guaranty Trust Co. is using SQLWindows and the SQLBase database to connect PC-LAN work groups to the IBM mainframe's DB2 relational database. "What attracted us was that Gupta had a complete product set, and the connectivity with DB2, which we needed," said Vince Cannatello, an assistant vice president of information systems in the firm's Global Technology Division.

"It's all about growing with controls," Chief Financial Officer Richard Noling explained. "The company's not being run wildly, but it is growing aggressively. It takes a bit more money than we're generating out of sales to grow. We could crank up the growth rate real heavy by throwing venture capital money at it, but we won't do that."

Traveling the telecommuting route

Gupta's cautious growth strategy has led the firm to a bold employee management mode: The vast majority of Gupta's 80-plus programmers work at home.

These programmers were hired for their experience, their self-discipline and their desire to pursue solutions to software problems well beyond the normal 9-to-5 hours kept by most workers. "We are very much into telecommuting," admitted Clark Catelain, Gupta's vice president of engineering and product development. The secret of successful telecommuting, Catelain said, is to hire "very senior people" who have proved themselves at other companies.

Company founder Umang Gupta said the trend started when co-founder Bruce Scott worked out of his home to save rent for office space. "We hired a couple more programmers, and we still didn't have office space," Gupta said. "After a while, it became part of the corporate culture."

Managing telecommuters differs from managing employees at corporate headquarters, Catelain said. "We manage them like contractors. They definitely work to deadlines, and we put financial incentives on hitting certain deadline targets." The negatives are easy to state: These workers are not around the water cooler or coffee machine, where executives can see them.

Yet they are in daily contact through electronic mail — sometime exchanging messages with Catelain four or more times a day. Moreover, "it's easier for programmers to focus without the distractions of the office," Catelain said. "If you have a 30-second commute from your bedroom to your study, you can get an idea, log on and get ready to go."

JEAN S. BOZMAN

Outsourcing could be $21B niche by 1996

BY NELL MARGOLIS
CW STAFF

Overwhelmed by the technologies that are increasingly indispensable to their firms' growth, U.S. business managers will boost outsourcing to a $21 billion business niche by 1996.

So concludes Livingston, N.J.-based market research firm Insight Corp. in a report released earlier this month.

Currently on the rise among Fortune 1,000 firms, outsourcing already accounts for some $6 million of computer industry revenue, according to Insight. What virtually guarantees its transition from buzzword to byword — and inspires Insight to forecast its growth at approximately 27% annually over the next several years — is the convergence of two trends: Information technology's role in commercial life is changing against a backdrop of economic, social, fiscal and even geographical instability.

The breakup of AT&T ended an era of certainty for users in the communications area; mainframe-to-desktop migration is keying in similar insecurity in systems, software and services. Meanwhile, globalization and recession have hit most firms high and low, spurring them to charge harder against mounting competition, but on shrunken budgets.

Computer vendors' reliance on systems integration as a key sales channel and the decline of customer spending on information systems support and software as a percentage of total spending are increasing the pressure, the report added.

Businesses, said Insight, are bound to cry "Help" — and outsourcing firms are massing to provide it.

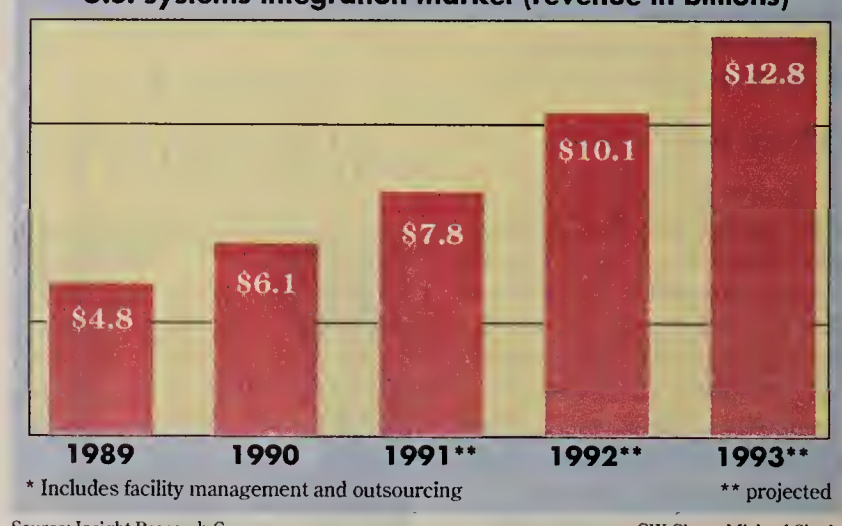
Conditions similar to those currently affecting the business world at large have sprouted up in discrete sectors in the past, making outsourcing a popular alternative in niches such as complex aerospace systems, medical insurance claims processing and air traffic control. Current outsourcing market leaders IBM, Electronic Data Systems Corp., Computer Sciences Corp. and Andersen Consulting alone should see an aggregate revenue rise from approximately $3.5 billion to an estimated $11.6 billion by 1995, according to Insight's figures.

There will be plenty left for the long list of outsourcing vendors currently challenging the leaders and the many that can be expected to enter the fray in the next few years. "In fact," the report said, "we expect this market to be fluid, where new players continue to enter the market while current players exit."

The safety of that particular prediction seems borne out by the fact that two of the players ranking high on Insight's list of second-tier outsourcing vendors — McDonnell Douglas Integration Systems and UK-based SD Scicon PLC — were acquired by EDS even as the Insight report went to press.

Up and outsourced

Large user companies' zeal for getting back to "the business of the business" is boosting outsourcing vendors toward a $12.8 billion market



Source: Insight Research Corp.

CW Chart: Michael Siggins

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Senior Vice President
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"The format is crisp and the style isn't wordy...and that's good. Because I don't always have the time to read long, in-depth articles. But I do take the time to scan the relatively short summaries in *Computerworld*. Then, if I want more information, I can read the whole article or do some further research.

"Of course, if you're going to be on top of the industry, you need to know what's happening while it's happening. And routing slips just don't get the job done. I can't remember the last time I saw a routing slip on a periodical at The Travelers. By the time you get the magazine, it's old news.

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INTERNATIONAL BRIEFS

One to get ready

▶ The **European Community** is set for a major new effort to restore the competitive position of its information technology sector, according to a recent report in the Belgian business press. An outline of the new effort surfaced in March. However, the implementation of the strategy awaits the drafting of a work program outlining concrete measures, which, in turn, must be translated into legislative proposals in 1992.

Five on the mark

▶ Five diverse Japanese companies banded together earlier this month to form a consortium to promote a standard for compact disc/read-only memory technology for use in electronic publishing. The quintet is made up of computer makers **Fujitsu Ltd.** and **Sony Corp.**, printing players **Dai Nippon Printing Co.** and **Toppan Printing Co.** and publishing firm **Iwanami Shoten Publishers.** The proposed consortium is based on the companies' earlier work on the so-called EPWING format, which is being pushed as a standard for publishing reference books, according to a recent report in the Japanese business press.

Three to go

▶ **Groupe Bull**, Italy's **Ing C. Olivetti & Co.** and Germany's **Siemens/Nixdorf Informationssysteme AG** have begun work on a Europewide communications network. The three formally agreed to join forces on the project at the end of August; however, needed **European Commission** funding has yet to materialize. Moreover, the trio could still face competition from **IBM** and **Electronic Data Systems Corp.**, both of which are U.S.-owned but have put down sufficient European roots to qualify for such funding.

Done deal

▶ Confirming earlier rumors to the effect, German chemicals firm **BASF AG** is taking full control of **Comparex**, the computer marketing company it formed nearly five years ago as a joint venture with German electronics giant **Siemens/Nixdorf Informationssysteme AG** (then Siemens AG). BASF will acquire Siemens' 33.5% stake in Comparex for an undisclosed sum in a transaction that is slated to close by today.

Falloff fallout

▶ Paris-based telecommunications equipment manufacturer **GPT**, which is jointly owned by UK-based **General Electric Co.** and Germany's **Siemens/Nixdorf Informationssysteme AG**, last week said it will cut 1,100 jobs from its 18,000 employee payroll following a falloff in orders for public exchange systems. The layoffs, a company spokesman told the *Financial Times*, will be spread across several GPT locations. However, he declined to state what percentage of the cuts would be involuntary or when they would take effect.

Easy as ABC

▶ The **Japan External Trade Organization** is offering three free booklets to foreign businesspeople: two on language and one on Japanese business practices. The books initially are available only in English, but the trade group plans to follow up with French, German, Italian and Spanish editions. Among them will be the following titles: *Doing Business in Japan — an ABC; Business Japanese ABC — Business Terms;* and *Business Japanese ABC — Conversation*, which comes with an audiocassette.

Vertical

CONTINUED FROM PAGE 71

ment of certain software technologies, the investment in Wang was the computer giant's first stake in a hardware and services firm actually expected to resell IBM hardware.

Hewlett-Packard Co. took on a similar task with its $20 million investment in Ask, which gave HP influence with a major channel to manufacturers.

The vertical integration rationale is also inspiring creative transaction structures.

The merger of banking software and services vendor Newtrend with software veteran Computer Associates International, Inc.'s Infopoint Banking Software Division is a good example. It provided CA with an enhanced channel into banks that want outsourcing services along with integrated banking software.

Meanwhile, the deal allowed Newtrend to complement its Unisys Corp. product offering with an IBM alternative.

In another variation on the vertical integration theme, some vendors are encouraging major resellers or integrators to invest in them.

This approach gives the channel a vested interest in moving the vendor's products. Ask achieved just such a result by persuading EDS to take an approximate 20% interest in Ask.

Ellison is a principal at Broadview Associates, a mergers and acquisitions investment banking firm located in Fort Lee, N.J.

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Vendors vie for Wang user base in product war

BY TIM WILSON
IDG NEWS SERVICE

HONG KONG — Wang Laboratories, Inc.'s Hong Kong customer base is about to be attacked from all sides. Both users and software developers looking for a way to port Wang applications to an open platform were shown migration tools earlier this month at "Wang Attack" seminars given by UK-based ICL. In addition, Digital Equipment Corp. revealed that it plans to grab a share of the vulnerable user base by introducing its own migration program here next month.

ICL announced its Wang Attack program last month, when it sent 1,400 mailings to Wang users to familiarize them with ICL's migration tools.

"It's not hype, blue sky and wonderful marketing noise," ICL Hong Kong marketing manager Gary Scarborough told his audience at one of the ICL seminars last week. "We have a product, and we have it today."

The product is VS-Power, a software application that converts programs written in Wang VS Cobol to Micro Focus Cobol/2 for the Unix environment.

Wang refuted the ICL/DEC claims, saying that its customer base is loyal and that most Wang proprietary VS users are satisfied with their existing systems. Users have expressed no desire to change, said Teresa Chan, Unix sales manager at Wang Pacific. "Whether it's open or not doesn't matter to them," she said. "If the applications do the job, [the users] may not want to change."

However, in the last six months, ICL has helped two Wang sites migrate to ICL Unix-based systems, according to Billy Lam, senior account manager at ICL Hong Kong.

Moreover, it is not only Wang's customers that ICL is poaching. "We have three to four ex-Wang technical staff in our department," Lam said. "We know the Wang system inside out."

Wang was extremely successful with its proprietary VS family until 1985. But as most of its competitors moved to standards-based systems, Wang clung to its proprietary line, and business gradually went downhill. In the past three years, Wang has lost close to $1 billion.

Scarborough said that Wang's vulnerability is a major reason for ICL's introduction of the Wang Attack program in Hong Kong. "That's an important point," he said. "Wang has a lot of problems. We're not going to go after someone that's strong and healthy and [whose] customers love them to death."

More to follow?

Scarborough said he believes other companies are planning to cash in on the situation by introducing similar migration programs. "I'm sure that IBM is going to do it, DEC is going to do it, and [Hewlett-Packard Co.] probably will too," he said. "We have a six- to nine-month lead."

However, it looks as if ICL has less time than that. Officials at the local DEC offices have revealed that next month DEC will also introduce an extensive program in the territory in which it will attempt to lure Wang users.

"We are going to roll out a very aggressive program," said Connie Wong, marketing manager at DEC Hong Kong. She said that the program is still under wraps, and details will be revealed at a later date.

Despite claiming that the majority of its user base remains loyal, Chan did concede that some users have expressed a clear interest in migrating to a Unix-based system. "But people that prefer to move to a Unix platform are not necessarily moving to an open system. There are so many versions of Unix that there is still the danger of being locked in."

In July, Wang announced that it will begin marketing relabeled IBM hardware. As part of the deal, both companies will jointly fund and staff conversion centers that will help develop migration tools for moving Wang customers over to IBM technology, according to Wayne Merrick, Asia-area marketing manager at Wang Pacific. "We'll be trying to keep our customers as happy as possible," he said.

Wilson writes for Computerworld Hong Kong.

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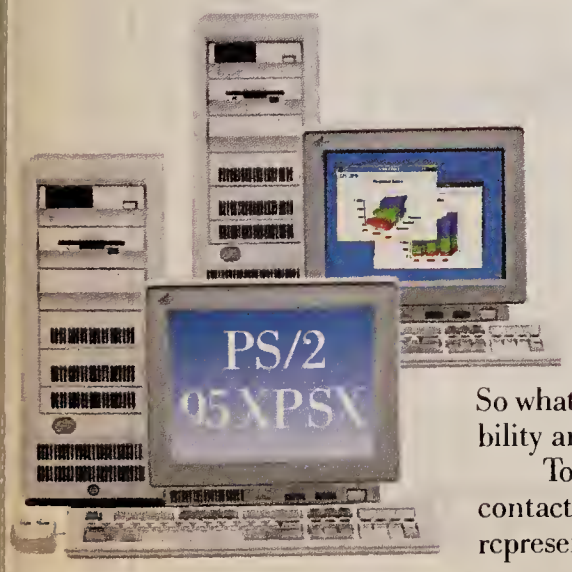

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Answer To
WYSE
Cerebral Aerobics
Program
No 8
On Page 18.

198 days. Look at it this way, every day the invader increased its height by one-half of its *original* height. So at the end of 198 days it reproduced its height 99 times and was therefore 100 times its original height.
(Fortunately, on the 199th day a twister happened along, ripped the sucker out of the ground and slammed it into a '79 doublewide over at Lazy Acres Mobile Villa.)

Visibility key in senior-level searches

Fast Track is a twice-monthly column dedicated to answering questions on career directions.

KEVIN M. STEELE
BRIAN M. HOFFMAN
SPECIAL TO CW

Q I have managed applications programming departments for the past several years and would like to move up into an information systems director or chief information officer position. I have talked to a number of recruiters, but they tell me that they simply don't target the higher level positions because of the relatively low numbers. How can I locate the "right" recruiters for these types of positions?

G.S.
Dallas, Texas

A CIO opportunities generally find you — not the other way around. Retained search firms do not respond enthusiastically to applicants who are on the market. Rather than approaching recruiters, create a more visible presence in your marketplace, and the opportunities will come to you.

Public speaking, writing articles for prominent journals in your field and holding officer positions in pertinent professional associations are good things to start with. An active public relations campaign should have opportunity knocking on your door before long.

Q I am Yugoslavian and am interested in working in the U.S. I have a bachelor's in electrical engineering and experience in the following areas: programming, expert systems, systems engineering and networking; a variety of system languages; and industrial automation and real-time control. What type of company should I target in the U.S.?

G.S.
Pirot, Yugoslavia

A There are two basic issues that will have an immediate impact on your search. First, an employer will need to know your current visa status. If you do not have a permanent authorization to remain in the U.S., you may have a difficult time generating interest in your candidacy. Second, your job search will be directly affected by whether you are here in this country or are trying to locate a job while remaining in Eastern Europe. Even in the best of markets, it is often difficult to access jobs when you are not physically present and are unable to respond to interview requests.

FAST TRACK
CAREER ADVICE FOR THE '90s

Once these issues are addressed, your first priority should be to target U.S. companies whose business base is parallel to your own experience. Demonstrate that you are able to put your foreign-based experience to work within the culture of U.S. companies. Thus, firms engaged in the development or use of industrial automation and real-time controls should provide good initial prospects.

Q What's the best way to turn down a job offer when you know it's not the right move for your career?

C.G.
Boston, Mass.

A I recommend the following tactics:

- Turn the job down as soon as possible. Don't continue to interview or negotiate with a company once you're sure the fit is wrong. Be considerate of its time and effort.
- Be straightforward. Tell them it's not quite the right fit and why. Be as honest as possible without being offensive.
- If the company was great but the job is wrong, tell them so. And tell the company you'd be very excited about talking again if something else more in line with your goals comes up.

Steele is executive vice president and Hoffman is vice president at Winter, Wyman & Co, an executive placement firm in Waltham, Mass.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, *375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Letters may be edited for brevity and clarity. Your initials and town will be printed unless you request otherwise.*

TIP of the MONTH

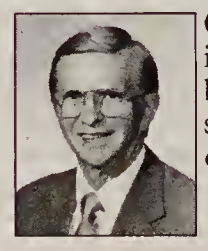
What are valuable traits in an IS employee?

I like team orientation: someone who not only works effectively with a team but who knows when to bring in outside help. I also like people who like to try different technologies.

Parry Lagro
Corporate Information Services
Alliant Health System, Louisville, Ky.

A good information systems trait to have is a strong service orientation but without trying to give users something they don't want. A lot of people in IS will try to find something "better" that the user is not comfortable with.

Richard White, MIS director
Union Texas Petroleum Corp., Houston, Texas



One desirable trait for an IS employee to have is to know how the business works. He should be able to analyze the business processes to ensure it makes sense to automate and be brave enough to say when it doesn't.

Joseph Nash, vice president
Management Information Services
Cadbury Beverages, Inc., Stamford, Conn.

I like employees who are able to deal with others and aren't just "yes" people. They stand their ground and make users justify their demands. They don't hide behind jargon and don't let technology get in the way of picking the best solution.

Robert Weese, IS supervisor
Aqualon Co., Louisiana, Mo.

A good IS professional will have the ability to perform in an incredibly reliable manner and apply creative solutions to real, not perceived, problems. He is also someone who consistently turns in a system that is more than perfect. It will look absolutely seamless, and you will be pleasantly surprised at the stuff built in.

Thomas Loane, Computers and Communications
Alamo Rent A Car, Inc., Fort Lauderdale, Fla.

Kathleen Gow is a free-lance writer based in Medford, Mass.

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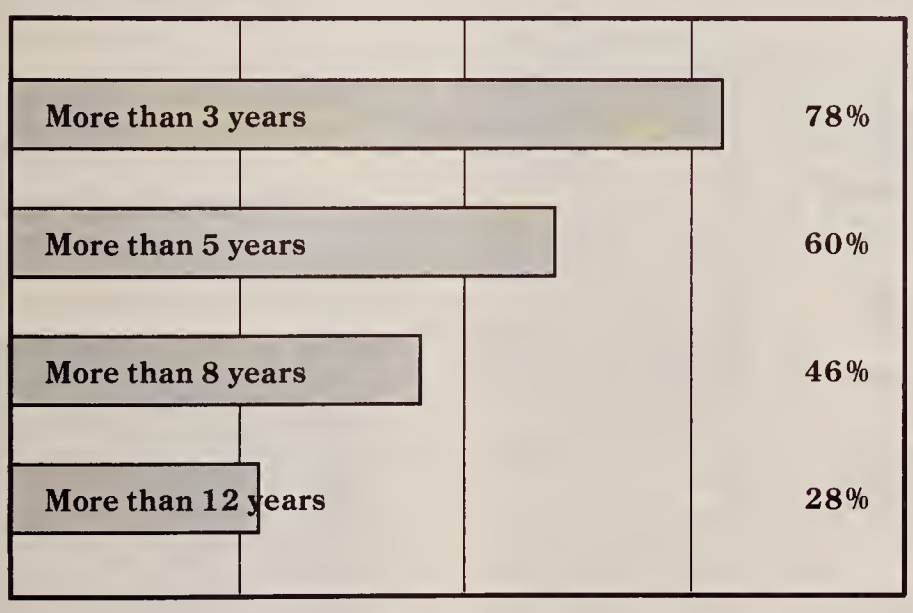

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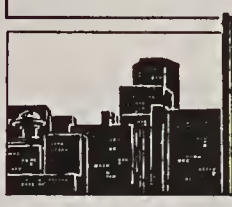

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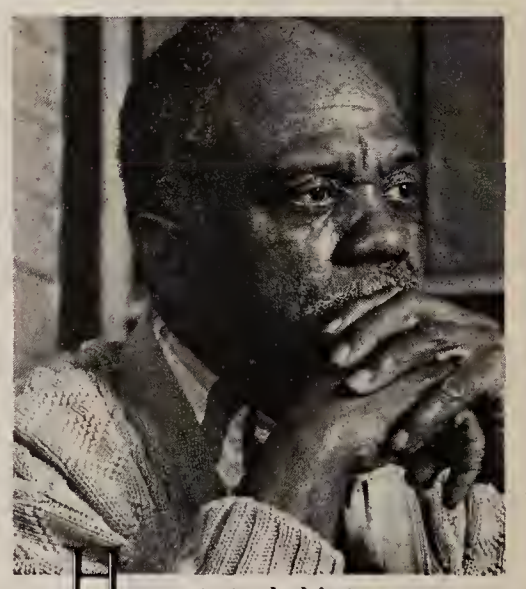

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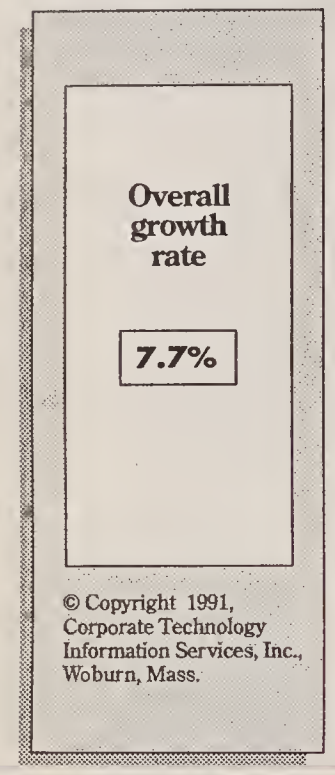

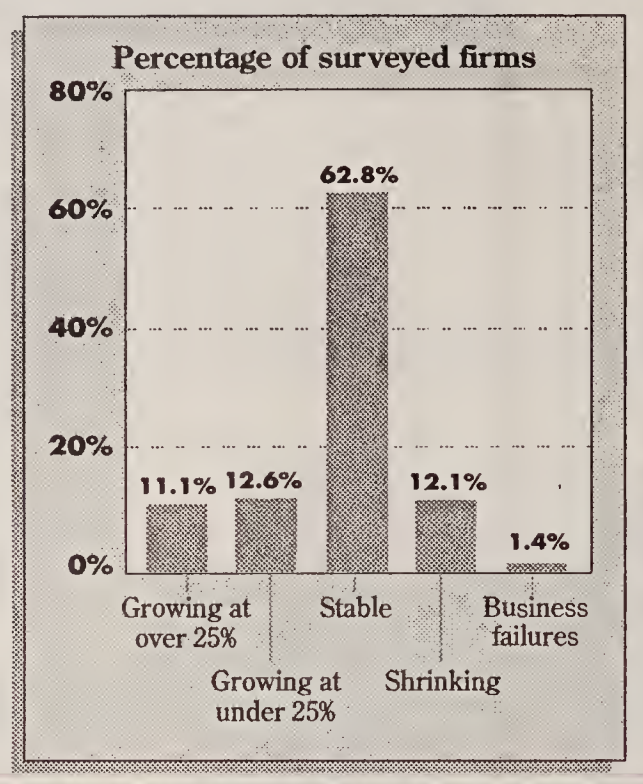

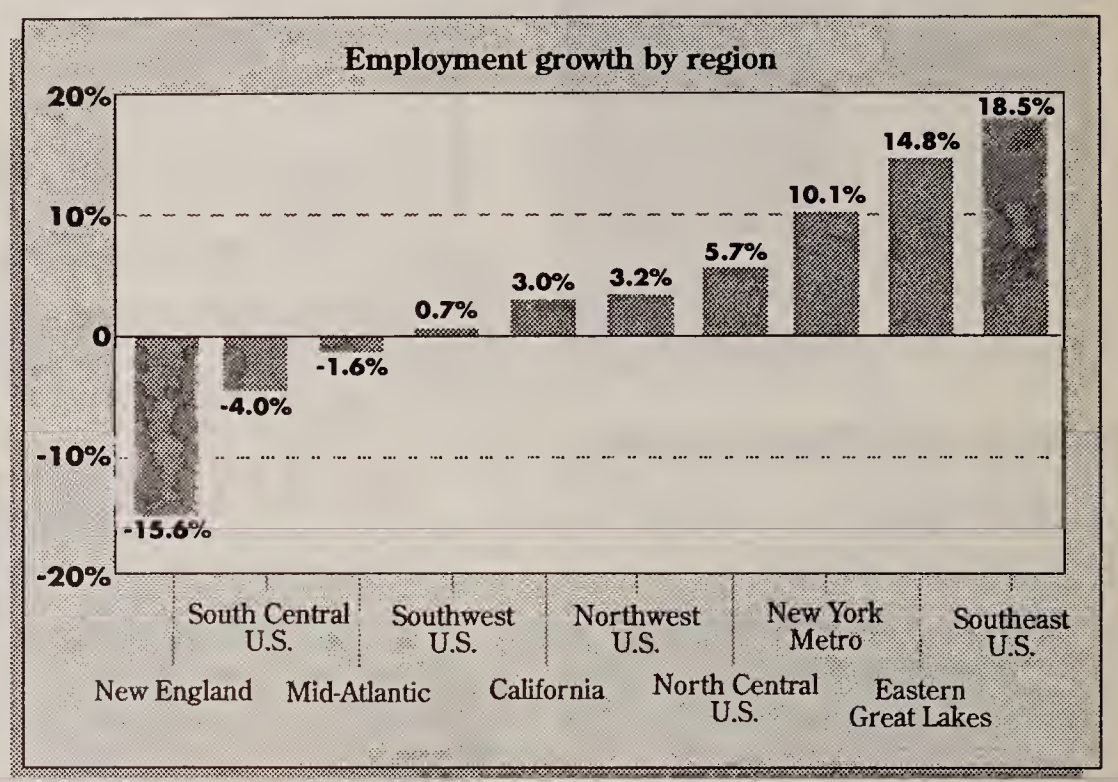

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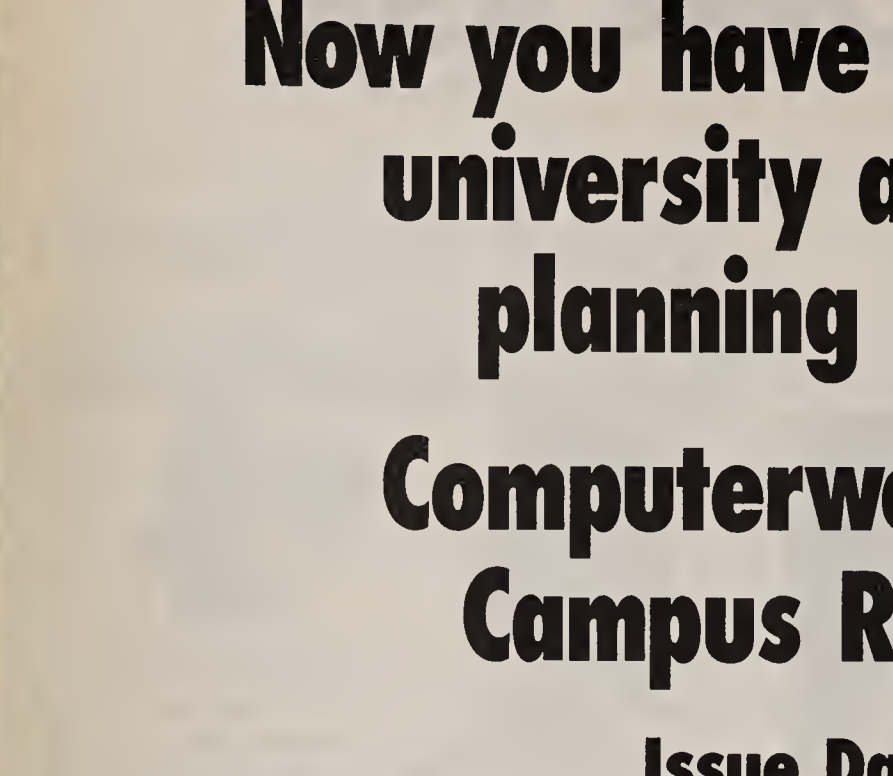

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- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
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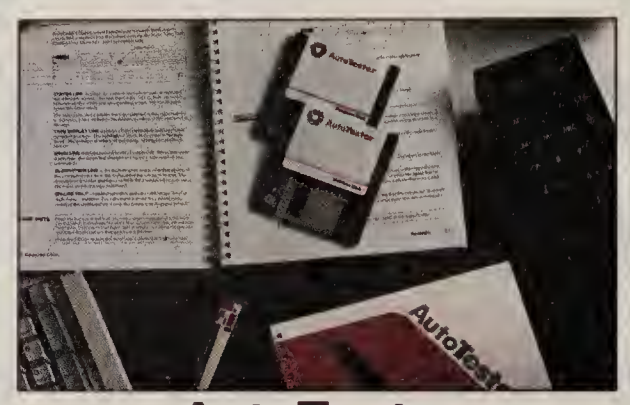

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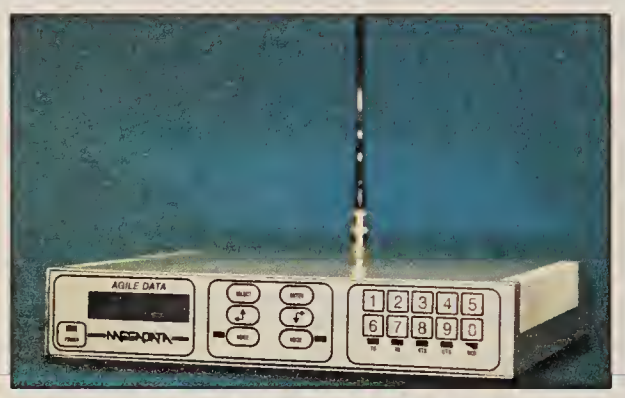

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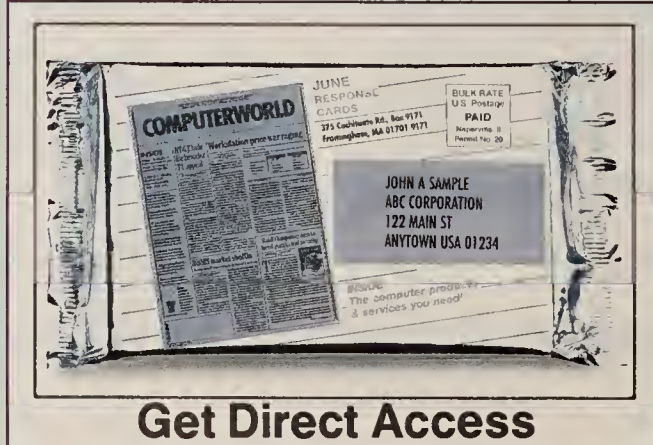

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Close legal doors on software locks

Legal Eye is a monthly column exploring legal issues and their impact on information systems.

BY MARC S. FRIEDMAN
and LYNN PUCHALSKI
SPECIAL TO CW

Information systems managers beware: Your company could lose access to vital data and applications if disgruntled vendors choose to implement software locks within your systems. These locks can be activated by a given time deadline or remotely by the vendor.

Fortunately, you can take measures to prevent costly business disruption by addressing the placement and possible use of locks in licensing agreements. Also, user companies have effective legal recourse if the vendor activates a lock but did not tell the company it was present.

The most recent publicized case of software disabling involved Revlon, Inc. and Logisticon, Inc. in October 1990. Logisticon remotely "pulled the plug" on Revlon's inventory management software after Revlon withheld partial payment because of bugs in the system.

Revlon claimed it suffered a financial loss because operations were disrupted for two days; the company subsequently demanded payment of damages. The case was settled out of court.

Knowledge counts

One past case indicates that software locks may be legal if both parties agree within a licensing agreement to their inclusion. But software locks will probably not hold up in court if the vendor does not disclose their existence to the buyer.

For example, in the case of *Franks & Sons, Inc.* v. *Information Solutions, Inc.*, the court ruled in favor of the buyer because the company was not informed of the presence of a lock.

The incident occurred four years ago when trucking firm Franks & Sons licensed a proprietary software system designed for the trucking business. The licensing agreement stated that all rights to the licensed software were to remain with the seller, Information Solutions.

The agreement also specified that the remaining purchase amount and license fee would be paid by Franks & Sons within 45 days after the system was fully installed and operational.

Franks & Sons found that the system had problems and deemed it was not fully operational. Information Solutions claimed the problems were routine maintenance, programming or operator malfunctions that would not render the system inoperative. At this time, the vendor disclosed the existence of a software lock or "drop-dead device." This particular lock, if activated, would prevent access to the software and the business data unless and until modified by a person with the proper access code.

Franks & Sons subsequently brought an action suit to the U.S. District Court for the Northern District of Oklahoma in order to seek monetary damages and a preliminary injunction restraining Information Solutions from activating its drop-dead device.

The court granted Franks & Sons its motion and ruled on the following:

- Information Solutions' system was not 100% functional.
- The drop-dead device was not contained within the agreement signed by the two parties.
- Franks & Sons demonstrated that if the software lock were activated, the firm would not only lose business but also gain a reputation for unreliability in its intensely competitive business.

The court indicated, however, that if Franks & Sons had known about the drop-dead device at the time of the contract, then its judgment would not have been sympathetic to the firm.

IS buyers can avoid such hassles by making sure the license agreement clearly outlines the use or nonuse of software locks.

A typical clause for the use of software locks might read, "Upon the default of licensee, the licensor shall have the right to activate an automatic shutdown feature, which is incorporated in the licensed software. The activation of the shutdown feature will immediately render the licensed software inoperable."

An IS buyer/licensee who has been assured that there are no locks in the software should include a clause similar to this statement: "Licensor expressly warrants that the licensed software does not contain any feature that would impair in any way the operation of the licensed software, including but not limited to software locks, or drop-dead devices. Licensor further warrants that it will not impair the operation of the software in any way other than that ordered by a court of law."

Finally, an IS buyer may want to include a protective clause for the accidental activation of a lock: "Licensor warrants and licensee understands that an automatic shutdown feature is incorporated in the licensed software, which if activated, would render the licensed software inoperable.

"Licensor further warrants that the automatic shutdown feature will be activated only if licensee fails to pay the licensor at least 50% of the sums due under the contract after the system is found by an independent consultant to have met the performance requirements.

"Licensor further warrants that if the automatic shutdown feature is activated for any reason other than the one stated above, licensee shall be entitled to all direct and consequential damages resulting therefrom."

A little attention to this item can save you and your company a lot of grief down the road.

Friedman leads the High-Technology Group at Friedman Siegelbaum, Roseland in New Jersey. Puchalski is an attorney at Friedman Siegelbaum who specializes in computer and technology litigation.

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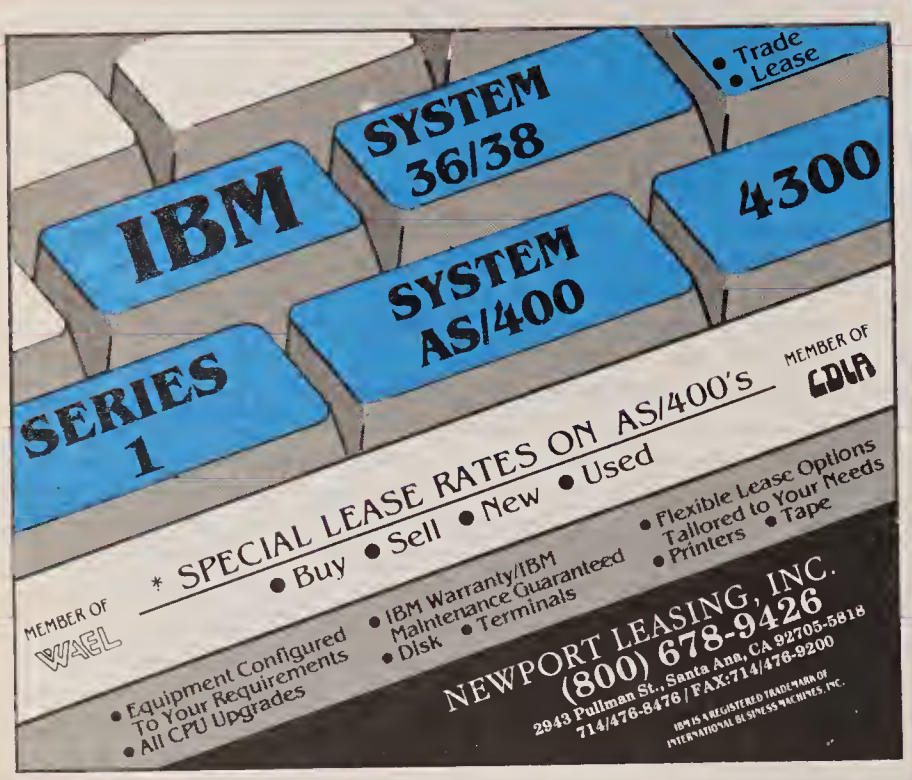

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All questions concerning this RFP must be received in writing by October 17, 1991 and will be discussed at a Bidders Conference on October 21, 1991. Proposals must be submitted not later than 4:00 pm, Monday November 18, 1991. All proposals must be hand delivered to the Design Department Contract Desk. The New York City Housing Authority is not responsible for mail or carrier delivery that does not meet the November 18, 1991 closing time.

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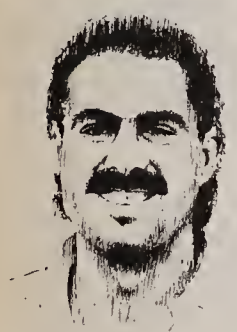

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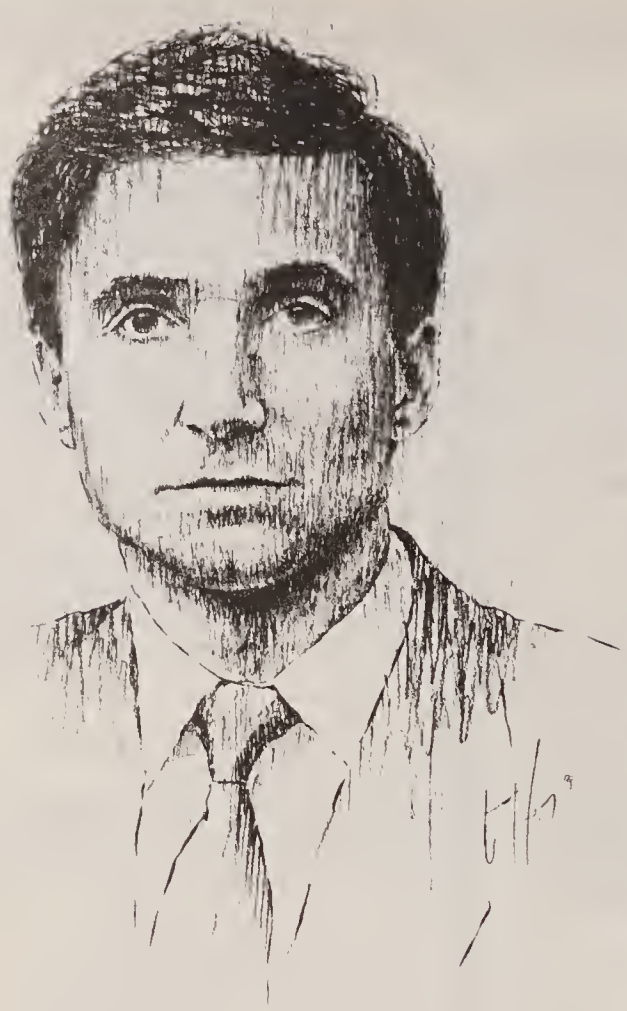

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President
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Spectrum Concepts, Inc. has grown over the past decade from a New York City based software consulting firm, to a leading supplier of communications software solutions worldwide. Its XCOM 6.2 software product set new standards for the industry when introducted in 1987, and continues to lead the way in LU 6.2 connectivity.

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RECOMMENDATION CHANGES

DOWNGRADED FROM BUY TO HOLD: **Digital Equipment Corp.** (Smith Barney, Harris Upham & Co.). Despite DEC's impressive service revenue growth, a renewed dedication to software and the year that has passed since the company's first restructuring charge, financial pressure on its operating capabilities remains. DEC's recent inability to generate demand for its midrange VAX 6000 and high-end 9000 machines is disturbing. Improvement does not appear imminent in view of a higher level of competitive pressure from IBM, which is poised to benefit from a new product cycle. IBM's Information Warehouse poses a threat to DEC's Network Application Support strategy.

UPGRADED FROM BUY TO STRONG BUY: **Convex Computer Corp.** (Alex. Brown & Sons, Inc.). The company's stock price recently dropped to a level that makes it an appealing buy. The drawn-out product transition to the C3800, the company's new high-end supercomputer line, and the C3400, a departmental supercomputer series, have diminished 1991 earnings potential. The firm said last week it expects to report a loss for the current quarter; however, Convex will pick up market share in 1992.

UPGRADED FROM HOLD TO BUY: **Valid Logic Systems** (Prudential Securities, Inc.). Unlike its competitors, Valid Logic is not facing a product transition. Product demand in the U.S. and Europe is OK, but demand in the Far East is strongest. Current-quarter earnings appear on target with estimates. Stock price year-to-date has more than tripled.

ANALYSIS IN BRIEF

Enterprisewide Systems
Bear, Stearns & Co., Sept. 20

Be cautious: The third-quarter earnings prereleases have started. **Intel Corp.**'s recent announcement that it will have a disappointing quarter will keep a cloud over the technology group until third-quarter reports are out.

Investment ratings on **Stratus Computer, Inc.** and **Sun Microsystems, Inc.** have been downgraded from strong buy to buy. Both Sun and Stratus stock have appreciated approximately 20% since July, and there seems to be no near-term event that would cause prices to advance further.

IBM keeps its buy recommendation because short-term events could affect its stocks positively. New mainframes and related products will boost the company's fourth quarter. Its third-quarter financials will be announced in mid-October.

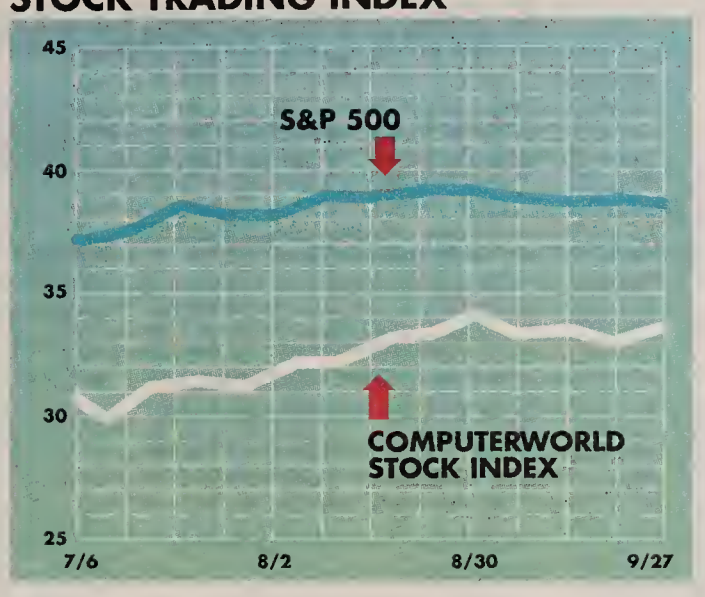
Minicomputers: Quarterly Update
Prudential, Aug. 30

Companies whose product cycles are in good shape are companies that are experiencing good earnings news — despite the weak international markets and the domestic recession.

Silicon Graphics, Inc. is a standout. It is not often that any company preannounces one quarter because earnings are far below Wall Street expectations and then in the next quarter announces earnings that exceed estimates. Silicon Graphics did that and more: It made up the revenue it had missed in the first quarter of 1991 and shipped its normal expected revenue for the second quarter. With several new products shipping, the current quarter looks bright.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Pyramid Technology, Inc. lost 1¾ points to 16¼. A $1.4 billion contract for computer services to the Internal Revenue Service that Pyramid and AT&T recently won over IBM was blocked. A federal panel said the IRS had no apparent reason to turn down IBM's cheaper bid. AT&T lost ⅛ of a point to 38; IBM was unchanged last week, closing Thursday at 104⅞.
- Among last week's big gainers, Compaq Computer Corp. picked up 1⅝ points to 33¾. After Oracle Corp. said sales and earnings were up last quarter, its stock jumped 2⅜ points — nearly 22% — to 13¼, just shy of a new 52-week high. Intel Corp. lost early in the week, then improved to close Thursday at 42¼, up ⅞ of a point.
- Unisys Corp. unveiled new mainframes last week, comparable to IBM's recently rolled out models. Unisys stock slipped ⅛ of a notch to 4¾.
- Losers last week included Cisco Systems, Inc., which tumbled 4½ points to 40¼.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, SEPTEMBER 27, 1991

TOP PERCENT GAINERS

Datapoint Corp.	200.00
Micrografx	27.45
Oracle Systems	24.14
Compression Labs Inc.	24.11
Control Data Corp.	23.44

TOP PERCENT LOSERS

Phoenix Technologies	-24.00
Corporate Software	-23.16
Pyramid Technology	-14.67
Computer Automation Inc.	-14.29
Wang Labs Inc. (b)	-13.04

TOP DOLLAR GAINERS

Computer Sciences	5.13
Compression Labs Inc.	4.25
Micrografx	3.50
Symantec Corp.	3.38
Xerox Corp.	3.00

TOP DOLLAR LOSERS

Adobe Systems Inc.	-3.75
Corporate Software	-2.75
Pyramid Technology	-2.75
Bell Atlantic Corp.	-2.50
US West Inc.	-2.38

Exch	52-Week	Range		Sept. 27 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 0.97%**
OTC	10.50	5.38	3 COM Corp.	8.75	0.25	2.94
NYS	69.75	55.75	American Info Techs Corp.	61.50	-0.50	-0.81
NYS	40.38	29.00	AT&T	37.63	-0.13	-0.33
OTC	4.13	0.88	Artel Communication Corp.	1.75	0.00	0.00
NYS	56.25	44.13	Bell Atlantic Corp.	45.25	-2.50	-5.24
NYS	56.25	46.13	Bellsouth Corp.	49.50	-0.75	-1.49
NYS	52.88	17.00	Cabletron Systems	48.50	-1.00	-2.02
OTC	25.88	8.25	Compression Labs Inc.	21.88	4.25	24.11
OTC	5.13	2.44	Data Switch Corp.	2.63	0.13	5.00
NYS	21.50	8.88	Digital Comm. Assoc.	15.25	-0.63	-3.94
OTC	25.25	12.25	Dynatech Corp.	15.50	-1.25	-7.46
OTC	12.38	5.00	Fibronix Int'l Inc.	7.00	0.00	0.00
OTC	3.75	1.75	Gandalf Technologies Inc.	2.75	0.25	10.00
NYS	3.50	1.63	General Datacomm Inds.	2.63	0.25	10.53
NYS	33.50	26.13	GTE Corp.	30.50	1.38	4.72
NYS	63.00	40.25	ITT Corp.	55.25	-1.63	-2.86
OTC	34.63	17.88	MCI Commmunications Corp.	29.13	0.50	1.75
OTC	10.63	2.75	Microcom Inc.	10.63	1.13	11.84
NYS	13.75	4.00	Network Equipment Tech.	12.50	-0.88	-6.54
OTC	14.25	4.38	Network General	14.25	0.25	1.79
OTC	18.88	8.13	Network Systems Corp.	17.38	-1.25	-6.71
NYS	41.00	22.63	Northern Telecom Ltd.	39.38	-0.63	-1.56
OTC	37.75	8.63	Novell Inc.	37.50	0.75	2.04
NYS	77.50	67.00	Nynex Corp.	77.00	0.25	0.33
NYS	47.50	38.50	Pacific Telesis Group	41.88	-0.25	-0.59
OTC	11.63	3.63	Penril Data Comm. Ntwks.	9.00	-0.25	-2.70
OTC	35.50	8.25	PictureTel Corp.	33.00	0.00	0.00
NYS	17.88	8.88	Scientific Atlanta Inc.	13.50	0.63	4.85
NYS	57.75	49.00	Southwestern Bell Corp.	55.00	-1.63	-2.87
NYS	31.50	20.63	United Telecom	25.00	0.38	1.52
NYS	40.75	34.00	US West Inc.	35.13	-2.38	-6.33
Computer Systems						**Up 6.29%**
OTC	20.75	4.50	Advanced Logic Research	12.50	-0.38	-2.91
ASE	17.88	10.38	Amdahl Corp.	13.38	-0.13	-0.93
OTC	73.25	24.25	Apple Computer Inc.	49.00	-1.63	-3.21
OTC	9.13	2.75	Archive Corp.	3.50	0.34	10.76
OTC	32.75	7.50	AST Research Inc.	29.38	1.88	6.82
NYS	9.38	4.00	Bolt, Beranek & Newman	6.38	0.00	0.00
NYS	21.63	4.50	Commodore Int'l	12.50	0.50	4.17
NYS	74.25	29.88	Compaq Computer Corp.	34.50	2.38	7.39
OTC	2.50	0.38	Computer Automation Inc.	1.50	-0.25	-14.29
NYS	13.75	6.75	Control Data Corp.	9.88	1.88	23.44
NYS	19.75	8.38	Convex Computer	11.25	-0.38	-3.23
NYS	44.50	20.00	Cray Research Inc.	42.50	1.25	3.03
NYS	21.38	3.50	Data General Corp.	21.38	1.25	6.21
NYS	4.13	0.88	Datapoint Corp.	4.13	2.75	200.00
OTC	36.25	8.25	Dell Computer Corp.	32.00	0.25	0.79
NYS	83.00	45.50	Digital Equipment Corp.	56.50	1.38	2.49
NYS	28.88	13.75	Harris Corp.	22.63	0.00	0.00
NYS	56.63	24.88	Hewlett Packard Co.	49.00	0.63	1.29
NYS	139.75	94.00	IBM	102.13	-2.00	-1.92
OTC	12.00	7.75	Information Int'l	9.50	0.75	8.57
NYS	149.00	106.00	Matsushita Electronics	116.25	-0.25	-0.21
OTC	20.88	7.25	MIPS Computer Systems	12.13	1.50	14.12
NYS	110.00	44.50	NCR Corp.	108.00	0.00	0.00
OTC	29.50	10.75	Pyramid Technology	16.00	-2.75	-14.67
OTC	20.25	7.50	Sequent Computer Sys.	8.75	-0.50	-5.41
NYS	47.25	18.00	Silicon Graphics	42.75	0.50	1.18
NYS	40.75	14.63	Stratus Computer Inc.	37.38	-0.88	-2.29
OTC	38.63	15.00	Sun Microsystems Inc.	30.00	-0.75	-2.44
NYS	17.63	8.88	Tandem Computers Inc.	12.63	0.38	3.06
NYS	36.50	23.38	Tandy Corp.	27.75	1.13	4.23
OTC	24.50	6.75	Teradata	21.00	-1.75	-7.69
NYS	6.13	1.38	Ultimate Corp.	2.88	-0.38	-11.54
NYS	7.00	1.75	Unisys Corp.	4.88	0.00	0.00
ASE	5.75	2.00	Wang Labs Inc. (b)	2.50	-0.38	-13.04
Software & DP Services						**Up 0.68%**
OTC	63.00	17.00	Adobe Systems Inc.	50.25	-3.75	-6.94
OTC	12.25	3.50	Aicorp	5.75	-0.25	-4.17
OTC	59.88	21.00	Aldus Corp.	40.00	2.00	5.26
OTC	28.50	12.75	American Mgmt. Systems	22.38	-0.25	-1.10
OTC	17.25	7.50	American Software Inc.	14.25	0.75	5.56
NYS	4.63	1.38	Anacomp Inc.	3.25	0.00	0.00
OTC	18.25	10.25	Analysts Int'l	13.25	-0.25	-1.85
OTC	16.63	5.13	Ashton Tate	15.00	0.13	0.84
OTC	12.25	4.00	ASK Computer Sys.	12.25	0.25	2.08
NYS	37.00	22.63	Auto Data Processing	33.88	1.00	3.04
OTC	62.25	32.00	Autodesk Inc.	50.25	0.00	0.00
OTC	35.50	18.50	BGS Systems Inc.	34.00	2.38	7.51
OTC	53.00	17.75	BMC Software Inc.	52.00	-0.25	-0.48
OTC	16.00	8.75	Boole & Babbage Inc.	9.50	0.13	1.33
OTC	64.25	16.50	Borland Int'l	45.75	-1.50	-3.17
OTC	20.88	5.13	Cognos Inc.	16.38	-1.38	-7.75
NYS	11.13	4.88	Computer Associates	8.00	0.13	1.59
OTC	17.75	9.50	Computer Horizons	12.00	0.75	6.67
NYS	73.25	38.25	Computer Sciences	64.75	5.13	8.60
NYS	11.25	6.63	Computer Task Group	8.63	-0.75	-8.00
OTC	22.75	13.00	Comshare Inc.	18.25	-1.00	-5.19
OTC	13.25	3.75	Corporate Software	9.13	-2.75	-23.16
NYS	52.25	31.25	General Motors E (EDS)	46.75	-1.88	-3.86
OTC	18.75	7.25	Goal Systems Int'l	13.50	0.00	0.00
OTC	7.00	1.88	Hogan Systems Inc.	5.63	-0.13	-2.17
OTC	29.13	7.75	Information Resources	28.75	-0.25	-0.86
OTC	7.88	2.63	Informix Corp.	7.88	1.38	21.15
OTC	3.63	1.38	Intellicorp Inc.	2.25	0.13	5.88
OTC	31.50	10.50	Intergraph	19.00	-1.25	-6.17
OTC	8.25	2.75	Interleaf Inc.	6.88	-0.38	-5.17
OTC	12.25	6.88	Intersolv	10.88	0.38	3.57
OTC	43.25	10.00	Knowledgeware Inc.	19.00	-0.38	-1.94
OTC	45.00	16.75	Legent Corp.	28.00	1.75	6.67
OTC	40.75	12.50	Lotus Development	32.00	1.00	3.23
OTC	19.00	9.00	Mentor Graphics	12.75	-0.38	-2.86
OTC	32.00	9.75	Micrografx	16.25	3.50	27.45
OTC	88.25	35.75	Microsoft Corp.	88.25	1.75	2.02
NYS	15.75	4.00	On Line Software Int'l	15.75	0.00	0.00
OTC	13.50	4.88	Oracle Systems	13.50	2.63	24.14
NYS	16.00	7.00	Pansophic Systems	15.75	0.00	0.00
OTC	10.00	1.25	Phoenix Technologies	7.13	-2.25	-24.00
OTC	37.75	18.00	Platinum Technology	34.75	0.50	1.46
NYS	53.75	33.38	Policy Management Sys.	53.50	1.00	1.90
NYS	25.50	11.50	Reynolds & Reynolds	25.50	1.25	5.15
OTC	13.00	6.75	Ross Systems	12.75	-0.25	-1.92
OTC	27.50	14.75	SEI Corp.	27.00	0.50	1.89
OTC	23.25	13.88	Shared Medical Systems	22.50	0.25	1.12
OTC	35.25	12.00	Software Publishing Corp.	17.88	0.13	0.70
NYS	16.75	5.50	Sterling Software	14.63	-1.63	-10.00
OTC	18.25	9.50	Sungard Data Sys.	15.00	0.38	2.56
OTC	65.75	17.75	Symantec Corp.	65.75	3.38	5.41
NYS	10.63	4.50	System Center Inc.	7.63	0.00	0.00
OTC	37.25	12.50	System Software Assoc.	21.00	0.00	0.00
Semiconductors						**Off 2.36%**
NYS	14.25	3.63	Advanced Micro Devices	9.50	-1.00	-9.52
NYS	12.50	5.50	Analog Devices Inc.	7.63	-0.25	-3.17
OTC	13.50	5.25	Chips & Technologies	9.13	-0.13	-1.35
OTC	59.25	28.00	Intel Corp.	42.25	0.00	0.00
NYS	12.50	5.25	LSI Logic Corp.	7.00	-0.13	-1.75
NYS	19.13	6.75	Micron Technology	14.63	0.50	3.54
NYS	71.25	45.75	Motorola Inc.	60.50	-0.63	-1.02
NYS	8.38	3.00	National Semiconductor	4.25	0.00	0.00
NYS	47.63	22.50	Texas Instruments	29.00	0.00	0.00
OTC	12.25	3.00	VLSI Technology	7.00	-0.38	-5.08
OTC	16.75	4.75	Weitek	6.75	-0.75	-10.00
ASE	6.88	2.50	Western Digital Corp.	3.13	0.00	0.00
Peripherals & Subsystems						**Up 0.61%**
OTC	2.75	0.88	Apertus Technologies	1.44	-0.13	-8.00
OTC	14.75	7.50	Banctec Inc.	14.25	0.25	1.79
OTC	21.75	4.25	Cambex Corp.	19.25	0.00	0.00
ASE	11.75	4.25	Cognitronics Corp.	7.63	-0.38	-4.69
NYS	31.25	14.63	Conner Peripherals	19.38	0.38	1.97
ASE	14.50	7.00	Dataram Corp.	14.25	0.88	6.54
NYS	13.00	4.88	EMC Corp.	6.13	-0.25	-3.92
NYS	47.25	33.75	Eastman Kodak Co.	42.25	-0.50	-1.17
OTC	11.25	4.75	Emulex Corp.	6.63	-0.25	-3.64
OTC	24.00	14.00	Evans & Sutherland	16.75	-0.50	-2.90
OTC	6.88	3.88	Iomega Corp.	6.88	1.06	18.27
OTC	28.25	8.00	IPL Systems Inc.	21.75	0.38	1.75
OTC	6.38	1.63	Maxtor Corp.	4.63	0.75	19.35
OTC	18.00	4.88	Micropolis Corp.	6.50	-0.25	-3.70
NYS	97.50	73.63	3M Corp	90.13	1.13	1.26
OTC	10.75	6.00	Printronix Inc.	6.50	0.00	0.00
NYS	24.75	8.50	OMS Inc.	23.00	0.13	0.55
OTC	18.25	8.25	Quantum Corp.	11.13	0.25	2.30
NYS	7.63	4.38	Recognition Equipment	6.25	-0.13	-1.96
OTC	11.50	4.00	Rexon Inc.	7.13	0.13	1.79
OTC	19.88	5.63	Seagate Technology	8.13	-0.25	-2.99
NYS	51.50	11.00	Storage Technology	44.13	0.13	0.28
OTC	4.75	1.25	Tandon Corp.	2.13	-0.13	-5.56
NYS	30.88	13.50	Tektronix Inc.	25.13	0.88	3.61
OTC	0.53	0.16	Televideo Systems	0.28	-0.03	-10.22
NYS	61.00	29.00	Xerox Corp.	61.00	3.00	5.17
Leasing Companies						**Off 1.30%**
OTC	16.25	7.00	Amplicon Inc.	15.00	0.00	0.00
NYS	28.38	14.75	Comdisco Inc.	19.63	-0.38	-1.88
OTC	15.75	8.88	LDI Corporation	14.50	-0.50	-3.33
OTC	4.50	2.25	Selecterm Inc.	4.25	0.00	0.00

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NEWS SHORTS

Mercedes out of Timeplex deal

The $207 million sale of Unisys Corp.'s networking subsidiary, Timeplex, Inc., went through late Friday minus one purchasing partner. Original South African-based joint venture partner Mercedes Information Technologies reportedly withdrew, leaving Swiss firm Ascom Holding AG the sole new owner.

IBM and Thinking Machines in pact

IBM allied itself last week with Thinking Machines Corp. in a move analysts said will help boost the scientific niche field of massively parallel supercomputing. Few details of the agreement were released, and no joint products or marketing are planned. IBM will supply Thinking Machines with access to its mainframe Enterprise System/9000 semiconductor and disk technologies while the smaller vendor offers its expertise in creating massively parallel supercomputers with up to 64,000 microprocessors.

FCC steps up to Caller ID issues

The Federal Communications Commission (FCC) said last week that it will establish federal policies on interstate calling-number identification (Caller ID) and asked for public comments on the controversial new telephone service. The FCC said calling parties should be allowed to block the display of their telephone numbers to called parties, and it sought comments on the merits, costs and feasibility of requiring an option allowing callers to block Caller ID on a per-call basis as well as comments on whether that option should be automatic or operator-assisted.

Epson to show color notebook

Epson America, Inc. will announce three upgradable notebook computers at Comdex/Fall '91 next month, including a battery-powered color notebook. In a separate announcement, Sharp Corp. in Osaka, Japan, said it will begin selling an 8.4-in. Thin Film Transistor LCD to vendors of notebook computers. Epson will preannounce its new notebooks today, in support of Intel Corp.'s release of the 25-MHz 80386SL chip. All three products will feature an Epson power management program the company claims is the first that will turn off the CPU when it is not in use.

Wang rolls out new PCs

Wang Laboratories, Inc. introduced seven personal computers last week. The PC Series line ranges from entry-level desktop models to systems capable of functioning as local-area network servers. Included in the announcement are four Intel 80386SX- and I486SX-based models using industry-standard architecture and three Micro Channel Architecture products sourced from IBM's Personal System/2 product line under the IBM/Wang alliance announced last June. Pricing ranges from $1,580 to $17,195. All of the products are scheduled to be available in October.

Shareholders OK merger

The planned merger of Borland International, Inc. and Ashton-Tate Corp. gained the approval of shareholders last week. Borland is in the midst of acquiring Ashton-Tate in a stock swap that is valued at $440 million. The acquisition remains subject to other conditions, including the expiration of the waiting period under federal antitrust laws that is scheduled to end Oct. 11.

User telecomm coalition forms

Citicorp, IBM, Electronic Data Systems Corp. and General Electric Co. have formed an informal "network" called the Coalition of International Telecommunications Users to speak out and lobby on issues of concern to companies with significant overseas telecommunications needs. In its first formal action, the group filed a petition Friday with the Federal Communications Commission opposing an FCC proposal that would require disclosure of private user information in international private-line arrangements.

Cost pressure spurs data center controls

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — In an attempt to shave operating expenses in a recessionary era, data centers across the country are installing console-automation software that literally removes the need for operator intervention.

Data center managers are learning how to restart their IBM mainframes from home — if need be — and are wondering what to do about veteran operators whose jobs have been automated out of existence.

Console-automation software, which has been trickling onto the market for the past three years, has finally come on-line at more than 40% of the 400 sites surveyed by the Association for Computer Operations Management (AFCOM).

Tremendous growth

"In the last year, console-automation growth has been tremendous," said Leonard Eckhaus, president of AFCOM, which held its annual conference here last week. "More than 40% of the data sites we surveyed have automated console systems [that were] installed this year, and 61% of the ones who don't have it expect to install some of it in the next two years." By contrast, AFCOM's 1990 survey showed that only 28% of surveyed sites were using console-automation software.

Studies by Gartner Group, Inc., in Stamford, Conn., have shown a similar trend. By 1995, the data center will be staffed by fewer, more highly paid workers, with job responsibilities similar to those of a systems programmer. "We're moving into the era of the dim data center," said Jeff Schulman, vice president of Gartner Group's Software Management Strategies Service. "Users are looking to console-automation software to make a big impact on the bottom line. In several years, you will find many large data centers that have gone to lights-out, with absolutely no operators around. The job of computer operator is going away," he said.

"The recession has caused an urgency about cost-cutting at many user sites," explained AFCOM keynote speaker Jim Woodhill, vice president of marketing at Mission Critical Software, Inc. in Houston.

Among the sites that have taken an automated-systems strategy, AFCOM members reported, were Bankers Trust Co. in New York, McDonnell Douglas Information Systems Co. in St. Louis and Rolm Systems in Santa Clara, Calif.

"We have 50 consoles in the room and only one or two operators," said Desi Dossantos, manager of data processing operations at Rolm, which uses Candle Corp.'s AFOperator automation products. A personal computer-based "outboard" system monitor, made by Votek Systems Ltd. in Toronto, combines system alerts that can be viewed by operators and by managers who have a Votek PC console at home.

Some operations managers at the AFCOM meeting wondered aloud whether their move toward unattended operations would spell the end of careers for data center employees with 15 to 20 years of experience. Many companies have tried to retain their operators through retraining programs, but other organizations are prepared to let their operators go, users said.

Taking control

Popular data center automation tools have found a home in more than one-third of surveyed data centers

1991 survey of 400 data centers in North America

	Percent of sites that have product installed
Tape management software	68.3%
Automatic scheduling software	65.6%
Console automation software	42.0%
Report management system	37.5%
Automated problem/Change management	37.5%
Environmental monitoring systems	36.0%
Network automation software	32.4%
On-line documentation	22.4%
Automatic account balancing	12.4%
Robotic tape library	5.1%

Source: AFCOM

CW Chart: Janell Genovese

Vendors, users choose SNMP over OSI

BY ELISABETH HORWITT
CW STAFF

Long criticized for being a generic protocol that lacks functionality to manage specialized network systems, Simple Network Management Protocol (SNMP) is due to get some beef, with upcoming introductions and demonstrations at next week's Interop '91 show.

The "de facto" SNMP has gained far more vendor and user support than the "official" standard, Open Systems Interconnect (OSI), several sources said.

Approximately 15% to 20% of Fortune 1,000 companies are either testing or actively using SNMP to manage part of their internetwork installations, said Todd Dagres, a director at The Yankee Group. By 1993, that number will reach 50%, he estimated. Fewer than 150 network management installations use OSI, according to CIMI Corp. in Haddonfield, N.J. Now, SNMP may go beyond its bridge/hub/router niche to all of the equipment and services that make up an enterprise network.

Several industry leaders have committed to supporting Remote Network Monitoring, an emerging SNMP protocol that defines how local-area network diagnostic and monitoring devices communicate with central management systems.

Last week, Hewlett-Packard Co. announced implementations of the Remote Network Monitoring protocol on its Lanprobe monitor and Openview management platform. Protools, Inc. introduced a LAN monitoring system based on the protocol. Cabletron Systems, Inc. promised the protocol for its Spectrum platform by first-quarter 1992. Digital Equipment Corp. said it will ship the protocol with the next version of Management Station for Ultrix.

Wide support of the protocol will help users "mix and match" one vendor's LAN diagnostic device with another's management platform, said Andrew Bach, director of communications engineering at Securities Industry Automation Corp., which would like to integrate HP's Lanprobe with DEC's network management system, he added.

SNMP is gaining support in other industry segments, with Network Equipment Technologies, Inc. announcing an SNMP-based management system for its T1 multiplexers this week and Banyan Systems, Inc. having done the same for its LANs last week. And at Interop, vendors will demonstrate new SNMP protocols for managing Fiber Distributed Data Interface LANs and Switched Multimegabit Data Service offerings.

McKesson to name Harrison as VP, CIO

BY CLINTON WILDER
CW STAFF

SAN FRANCISCO — Former American Airlines and Bankamerica Corp. information systems executive Russell Harrison was scheduled to be named today as McKesson Corp.'s vice president and chief information officer.

Harrison, a close lieutenant of Max Hopper, American's IS chief, has been president of AMR Information Services since 1986. He worked with Hopper at the end of his 11-year career at Bank of America and went with Hopper to American in 1986.

Although McKesson has often been mentioned as an IS applications pioneer for its drug distribution systems and pharmacy on-line order entry, it has never had a corporate-level IS executive position. The highest-ranking IS executive was Jon D'Alessio, who headed IS at McKesson Drug Co., the largest operating division.

With Harrison's appointment, D'Alessio becomes staff vice president of planning.

Harrison will report to both Chairman and Chief Executive Officer Alan Seelenfreund and President and Chief Operating Officer Rex Malson. He will begin work at McKesson in mid-October.

The new CIO position has responsibility for IS in all of McKesson's diversified divisions. Dallas-based AMR Information Services has not yet named a replacement for Harrison.

Harrison worked at Bank of America in senior IS positions both here and in London. He formerly worked at Electronic Data Systems Corp.

$3B award

FROM PAGE 1

data services — an estimated $350 million in the first year. The contract is expected to begin Nov. 1.

General Dynamics' IS function was rated No. 1 in the aerospace industry by the *Computerworld Premier 100* in 1989 and 1990. But reduced U.S. defense spending has taken the cost-cutting scythe across the $10 billion firm this year. The Data Systems Division had cut about 1,000 positions before the outsourcing announcement, according to Asaph H. Hall, corporate vice president of IS and administrative services.

A big motivation for outsourcing, Hall said, was to liquidate a huge IS infrastructure that will become a liability as General Dynamics continues to shrink. "We are trying to deal with the realities of the defense marketplace," he said. "This moves $140 million in assets off the balance sheet and gives us a $200 million cash infusion — that's good for shareholder value." Hall declined to specify how much the firm expects to save.

Hall is one of several General Dynamics corporate-level executives whose compensation incentives are tied to the company's stock price in a plan implemented by new Chairman William A. Anders, who took over Jan. 1. "Under any prior management team at General Dynamics, this deal never would have been done," said Melvyn Bergstein, a former CSC executive who led the firm's negotiating team. Bergstein left CSC to join systems integrator Technology Solutions Corp.

The megadeal vaults CSC into the "Big Four" commercial outsourcing players along with IBM, Electronic Data Systems Corp. and Andersen Consulting, said Stephen McClellan, vice president of securities research at Merrill Lynch & Co. in Santa Monica, Calif. "I had been waiting for them to make a splash in the commercial market for a long time, but this is more like a nuclear explosion," he said.

Although the contract guarantees a lucrative revenue stream for CSC, some analysts wondered how much CSC will be able to leverage the business to woo other commercial accounts. "I don't consider this a huge move into the commercial marketplace because General Dynamics is very similar to the federal government in the way they operate," said Rich Schmitt, president of the St. Louis-based Schmitt Consulting Group.

CSC will acquire large General Dynamics data centers in Fort Worth, Texas; Norwich, Conn.; and San Diego, as well as 28 other IS-related facilities nationwide. Although hardware consists primarily of IBM mainframes, it also includes an Amdahl Corp. mainframe and supercomputers from Cray Research, Inc. and Control Data Corp.'s Cyber Division.

McClellan estimated that CSC may look to trim about 500 positions from the 2,600 acquired from General Dynamics. Honeycutt admitted CSC "might rework some data centers and get some economies" but declined to name specific figures.

General Dynamics "talked to just about everybody" in the outsourcing business but never undertook a formal request-for-proposal process, Hall said.

The company will retain about 800 developers who work on so-called deliverable software — the systems that guide the firm's defense products.

Head of the class

Computer Sciences Corp. has bagged the top outsourcing contract

Company	Value	Contract under
General Dynamics Corp.	$3B	CSC
Continental Airlines	$2.1B	EDS
Enron Corp.	$750M	EDS
Continental Bank	$700M	EDS
First City Bancorp	$600M	IBM
Eastman Kodak Co.	$500M	IBM
National Car Rental System, Inc.	$500M	EDS
First Fidelity Bancorp.	$450M	EDS
First American Bankshares, Inc.	$400M	Perot Systems

Source: Merrill Lynch Capital Markets — CW Chart: Michael Siggins

Continental

FROM PAGE 1

resources, all of the smarts of the world about information technology."

Continental Vice Chairman Richard Huber reaffirmed this last week, saying, "The integration of new technology into our business is a critical competitive need, and we at Continental Bank have found that keeping abreast of breaking technology has been an increasingly difficult and costly task."

Huber said Continental expects to save by not having to pursue new technologies and by smoothing out what he termed the "lumpiness" of major systems projects. Continental said it wants to undertake a major systems rearchitecture, known as Vista [CW, Aug. 13, 1990], while maintaining its current systems.

Sources said ISSC intends to use Continental and its information systems staff as its base for outsourcing in the Midwest.

Michael Abramson

Theobald *calls outsourcing a "vitamin shot"*

"We're very happy to be considered the prime candidate and will now work toward closure of the contract," an IBM spokesman said.

ISSC will at least bring a project executive into Continental, said Bill Minihan, Continental's senior vice president of technology and capital markets operations. It was unclear whether ISSC will retain Continental's IS staffers in their current positions or bring in additional ISSC employees.

Huber said the move did not constitute a rejection of former Chief Information Officer John Gigerich's Vista architectural plan. Gigerich resigned from Continental two months ago (see story at right).

"I think this validates John's Vista vision," Huber said, adding, "We felt it was strategically correct; we were just having difficulties implementing it."

Minihan said Continental will retain perhaps 20 members of its 450-person IS staff.

ISSC said it will offer jobs to all the other IS employees.

Mitchell Claver, Continental's director of technical services, said last week's announcement immediately improved IS employee morale at the bank.

"Uncertainty is always bad for morale, so I would say the initial reaction . . . was in general pretty positive," Claver said.

"Decision-making on technology remains in the bank," Minihan said.

IBM is Continental's primary hardware supplier, but Minihan said future hardware choices would not be limited to IBM.

Taking care of business

Continental Bank's new orientation toward business customers didn't connect with its IS investment

CIO: John Gigerich

1991 IS budget: $70 million*

Data center value: $15 million*

Number of PCs and terminals: 4,000*

Total assets: $27 billion

1990 revenue: $933 million

1990 profits: $74.6 million

*CW estimates

Source: CW *Premier 100* — CW Chart: Janell Genovese

Outsourcers woo Gigerich

John Gigerich, chief information officer at Continental Bank since January 1988, left the company two months ago as part of the bank's outsourcing push because he was a job candidate for several of the firms bidding for the deal.

"It was inappropriate for me to stay in the decision cycle if I could end up working for one of these [companies]," Gigerich said.

Gigerich was responsible for setting in motion the Vision for Information Systems Technology Architecture (Vista) at Continental [CW, Aug. 13, 1990]. He also recommended that the bank consider outsourcing.

"It was a logical extension once [Vista] was in place," he said. "Who builds it is much less important than deciding the what and the how."

David Joel

Gigerich, *fielding job offers, will likely pick an outsourcing firm*

He will continue to consult for Continental until he decides, within the next 30 days, where he will work.

Gigerich said there was a 90% chance he would go to work in the outsourcing consulting field rather than accept another CIO job.

MICHAEL FITZGERALD

Unisys aims for IBM's Summit

Troubled firm's hopes riding on power of 2200/900 mainframe series

BY MARYFRAN JOHNSON
CW STAFF

BLUE BELL, Pa. — Unisys Corp. last week launched its head-to-head competitor to IBM's Enterprise System/9000 Summit mainframes with the announcement of the Unisys 2200/900 mainframe series.

"There's no question Unisys technology is outstanding and cost of ownership is lower over time than IBM," said Robert Kidd, an analyst at Dataquest, Inc. in San Jose, Calif. "This announcement should do a lot to preserve their major accounts and installed base."

Unisys' Patton: *This mainframe is open and nonstop*

However, the real task the financially troubled Unisys faces is "convincing the industry they will survive," said Jim Cassell, vice president of large computer strategies at Gartner Group, Inc. in Stamford, Conn. "Until their marketing can go outside their installed base, the company can't grow," he said.

For the quarter ended in June, Unisys reported a disastrous net loss of $1.3 billion, including pretax charges of $1.2 billion in its commercial computer business to cover a planned work force reduction of 10,000 employees.

At the mainframe announcement, Unisys officials made a point of swearing allegiance to open systems standards for their proprietary mainframe line, in part by committing to the Posix standards as they develop. Oracle Corp. also announced that it is porting its relational database management system to Unisys, with availability early next year.

"This mainframe is open, nonstop and virtually unlimited in capacity," said William Patton Jr., senior vice president at Unisys.

In early 1993, a new version of Unisys' OS 1100 operating system will include Posix standards 1003.1 and 1003.2, allowing users to run whatever Posix-compliant applications are available then.

"Unisys probably has its act together in open systems as well as any other vendor, from workstations through mainframes," Cassell noted.

Geared for high-speed on-line transaction processing (OLTP) and claiming the "fastest OLTP in the world," Unisys officials said their new Extended Processing Architecture (2200/XPA) will enable high-volume processing with up to 16 processors linked to a single host.

The nine new models, ranging in price from $8 million to $16 million, include two-, three- and four-processor machines that more than double the processing power of the previous high-end boxes in the 2200 line.

Once the 900 series begins volume shipping in the second quarter of 1992, customers can create 16-processor systems by linking four quadprocessor 900s. That configuration can process more than 5,000 transactions per second, Unisys executives said, and should appeal to the 65% of their 1100/2200 customer base that buys the largest systems available.

By 1993, Unisys is promising 128-processor configurations made by linking 16 eight-processor machines together — more power than anyone can envision using today and twice what IBM has committed to produce with the System/390, analysts noted.

"Who the heck would want to link up 16 of these beauties in our lifetime? Nobody on the planet needs to do that," Cassell said. "I think the message Unisys is putting forward is that growth is not an issue."

Among the largest commercial applications handled by mainframes today is United Airlines' reservation system, which gets by on eight IBM 3090 Model 200s — "significantly less horsepower" than Unisys will be delivering within several months, Cassell pointed out.

First-day orders for the new mainframes topped $150 million, according to company officials.

David Prager, director of computer operations and support for the New York State Department of Social Services, said his department was interested in acquiring 900 series machines in a few years. For now, however, his four 2200/633 models have enough capacity to manage the department's needs.

The same was true at Carnival Cruise Lines, Inc. in Miami, which uses a 2200/622 model for OLTP. "We will need more OLTP later as we move toward the [mainframe as] information hub concept," said William Ball, manager of computer services at Carnival and a member of the USE, Inc. Unisys user group.

"I think reaction in the installed base will be very positive," Ball said.

Family additions

Systems in the Unisys 2200/900 family, slated to be available in second-quarter 1992, will more than double their predecessors' power

Selected models

Model	Price	MIPS	Channels	Number of processors	Total memory
9211	$8.3M	79	48	2	256M bytes
9222	$9.3M	79	96	2	512M bytes
9322	$12M	108	96	3	512M bytes
9333	$13M	108	144	3	768M bytes
9422	$14.5M	134.5	96	4	512M bytes
9444	$16.5M	134.5	192	4	1G byte

Source: Unisys Corp. with Gartner Group, Inc. performance estimates

CW Chart: Janell Genovese

Frame relay

FROM PAGE 1

Young is now using its integrated T1 network with voice and data for data and image traffic, with voice services migrated back to the public-switched network.

This movement is actually fueling the interest in frame relay, according to John R. Rufener, a systems manager at Wiltel. "Users are having trouble cost-justifying their T1 networks for data alone," he said.

In addition to Sprint, BT North America, Inc. announced the immediate availability and pricing of Expresslane, its 56K/64K bit/sec. trans-Atlantic frame-relay service; MCI Communications Corp. reiterated its plan for a cell-based networking fabric for its backbone network that will include frame-relay services; and Tulsa, Okla.-based Wiltel, the domestic carrier with a commercial frame-relay offering, added a 56K/64K bit/sec. option to its initial 256K and 1.02M bit/sec. access speeds.

Notably missing from the hullabaloo was AT&T, which has yet to disclose its frame-relay strategy. "We're still at this point considering whether or not to make such an offering," an AT&T spokesman said.

AT&T's stance is understandable, analysts said, given that frame relay could leach customers from their dedicated private networks, a market in which AT&T is the leader.

"While AT&T doesn't have a service yet, they will — they have to," said John McQuillan, president of McQuillan Consulting in Cambridge, Mass.

Both Sprint and BT said they will sell bundled services, including a router/bridge and the local-access private line under Tariff 8, or they will unbundle the service for customers that have certified router/bridge equipment.

> NOTABLY MISSING FROM the hullabaloo was AT&T, which has yet to disclose its frame-relay strategy. "We're still considering whether or not to make such an offering," an AT&T spokesman said.

Sprint said it would offer service in two flavors: a "standard" and a "reserved" service. The first will be priced on usage; the second will have a flat rate and guarantees customers a minimum bandwidth for transmission. BT and Wiltel are offering monthly flat-fee rates.

For the time being, users will have to access the services over dedicated pipelines. However, local telephone companies have in recent months announced plans for frame-relay trials.

According to Michael Elling, vice president at Oppenheimer & Co. in New York, this indicates that these carriers have awakened to the fact that users may not accept the fixed-rate speeds of Switched Multimegabit Data Service (SMDS) or expensive SMDS equipment.

At TCA, in fact, US West Communications Group, Inc. launched a new business unit to sell LAN interconnection services. Called Advanced Communications Services, the group will push SMDS and frame relay, with commercial introductions for both slated for the second quarter.

Frame-relay technology is not without gaps, however. In particular, there is currently no frame-relay equivalent to the X.75 gateway protocol for linking X.25 networks.

Also, frame relay will not be suitable for voice traffic until carriers begin supporting T3 (45M bit/sec.) frame-relay rates on their backbone networks, observers said.

Raves greet debut of BT frame-relay gear

BY JIM NASH
CW STAFF

When BT North America, Inc.'s new frame-relay service and equipment debuted last week, it already had a cheering squad. An early user of the service praised it on a number of points, not the least of which was cost.

Two months ago, Michael Higgins, technology support manager at San Francisco-based Byer California, replaced the X.25 backbone product from BT that he had been using to tie together his nationwide network. Higgins said he connected the San Francisco offices and New York facilities with BT's frame-relay service. BT provides the service and all the hardware needed to use the service, he added.

In terms of transferring large files coast to coast, Higgins estimated frame-relay was eight times faster than Xlink, BT's X.25 service. The increase, he explained, can be attributed to the larger packet-size frame relay allows. But he noted that even simple calls were four times faster than Xlink.

Looking at the $2,100-per-site monthly license fee, he said, "I could not run any form of leased line for what I'm paying." In fact, referring to a factory Byer runs in Los Angeles, Higgins said it would be cheaper to use BT's frame-relay service to link two nearby buildings than to run cable between them.

Steve Taylor, president of Distributed Networking Association, a market research firm in Greensboro, N.C., said he was doubtful that broad conclusions could be found in a preliminary test such as Higgins'. Taylor said a traditional beta test would require conditions approximating real life, and in this case, few others would have been using BT's service.

"But I don't consider [our experience] a beta," Higgins said. "This is production." He said the bicoastal links he set up operated like "a 3,000-mile-long Ethernet network."

Taylor said BT's early entrance on the frame-relay scene could win it "some bragging rights, but the market is moving so quickly that anyone who goes into production by the end of this year will not suffer negative impacts."

Sun uncorks multiprocessing servers

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — Sun Computer Corp.'s first multiprocessing servers will be unveiled today in a bid to refresh its offerings in the commercial systems market after a two-year hiatus since the Sun Microsystems, Inc. subsidiary's last server introduction.

Although the servers trump competitors in overall price/performance, industry observers viewed them as an interim system that will not be fully functional until the next version of Sun's Solaris operating system is made available in mid-1992 and the next generation of Sun's CPU is available at about the same time.

Solaris 2.0, from Sun subsidiary Sunsoft, will allow for increased database and file server capability as well as allowing applications to be spread across CPUs simultaneously, according to Douglas Kaewert, systems marketing director at Sun Computer.

Dave Bennett, director of MIS at Dunkin' Donuts of America, Inc. in Randolph, Mass., will wait for Solaris 2.0. He said that although the multiprocessing option will allow him to grow his current Model 490 server from 150 users to 2,000 in the next few years, he does not want to have to take an interim step while a new operating system and new CPUs are worked out.

Doug Cook, an analyst at Dataquest, Inc. in San Jose, Calif., said that there is pent-up demand in Sun's installed base for the servers, so despite the lack of "barn-burner technology," he said he thought they would still sell well.

Latecomer

Sun is seen by analysts as being late to the midrange commercial systems market. Its last uniprocessor server was introduced in 1989. Even within Sun's Scalable Processor Architecture arena, other companies such as ICL, Inc. in Irvine, Calif., and Solbourne Computer, Inc. in Longmont, Colo., beat Sun to the market. Solbourne's multiprocessor was introduced in 1989, and ICL's started shipping this January.

The servers, known as Galaxy, will run more than 100 million instructions per second in a four-processor configuration and will have a Specthruput rating of 90.3, according to Sun. Specthruput is a multiprocessor benchmark from the Systems Performance Evaluation Cooperative consortium.

Price/performance for the servers beats published ratings on the competition. Sun rates the four-processor configuration at $2,200 per transaction. In contrast, the highest ranked system by the Transaction Processing Performance Council in benchmarks to be published today found Data General Corp.'s Aviion AV 5225 rated $2,321 per transaction.

The Sun also serves

Sun's multiprocessing servers break the 100 MIPS barrier

	Sparcserver 630MP	Sparcserver 670MP	Sparcserver 690MP
MIPS (4 CPUs)	100+	100+	100+
Transactions/second	121.5	121.5	130+
Cost per trans./sec.	$2,081	$2,222	N/A
Memory (megabytes)	64 to 128	64 to 640	64 to 640
Total disk capacity (gigabytes)	26	26	52
Price	$57,500	$72,500	$104,500

Source: Sun Microsystems, Inc. CW Chart: Janell Genovese

LAN analysis rivals targeting ease of use

BY JIM NASH
and ELISABETH HORWITT
CW STAFF

Rivals Network General Corp. and Protools, Inc. bumped heads last week with introductions of products designed to help less sophisticated users make good use of their local-area network analysis tools.

The high cost and technical complexity of most LAN analysis tools have typically put them beyond the reach of any but the largest corporations with sophisticated internetworks and management staff, said Warren Waldbrand, director of research at Network Management Report in New York.

By emphasizing ease of use, Network General and Protools can address the much larger market of companies that want to manage a smaller number of distributed LANs but cannot afford expensive tools and human experts, he added.

Network General has announced expert system-based technology that will allow its existing Sniffer Network Analyzer and Distributed Sniffer products to identify and analyze problems on extensive networks in real time, minimizing the need for human expertise.

The Expert Sniffer's built-in knowledge base is said to identify more than 100 physical and application-level network problems automatically and to integrate that knowledge with new data about a specific network.

Dell Holmes, lead analyst at Halliburton Corp.'s computer technology services department in Arlington, Texas, said he saw a demonstration of the new Sniffer on his network and was impressed. The program found a couple of broadcasting storms and many duplicate network addresses of which he had been unaware. His only criticism was that the programming was too rigid, not allowing him to tell the Sniffer to ignore some problems it repeatedly found.

Network General claims the updated Sniffer will be able to learn which devices are on a network and what their addresses are simply by listening to traffic.

Outfitted with the new technology, the Sniffer will be able to see problems as they arise through the use of variable thresholds, determine if they are important, alert managers and suggest corrective options.

Protool's Distributed Network Control series performs the same local LAN analysis tasks as the company's existing Protolyzer product while providing the user with a central console from which to view, analyze and respond to events at remote LAN sites, according to the Beaverton, Ore., firm.

The system can also be programmed to respond automatically to correct a traffic or error problem before it reaches critical levels, Protools product manager Mohan Nair said.

While Protools' new offering contains no expert system, its Network Consultant component is said to allow the user to create, store and initiate packaged responses to common network problems. The product can also walk the neophyte user through problem solving, Nair said.

The Distributed Network Control series is priced at $8,000 for the Foundation Manager and $1,300 for each cornerstone agent. It runs on Microsoft Corp.'s OS/2 and is scheduled to ship Oct. 31.

Network General will ship its upgraded Sniffer board and software for $12,500 and its upgraded Sniffer with a workstation for $16,750 — the same prices for current versions. Shipping is scheduled for mid-1992. At about the same time, Network General plans to fold its Watchdog monitoring product into the expert-equipped Sniffer.

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Sun seeks Intel Unix

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Sunsoft took a big step last week toward fulfilling its promise to move its Unix operating system to the Intel Corp. platform.

The Sun Microsystems, Inc. subsidiary said it reached an agreement in principle to acquire Santa Monica, Calif.-based Interactive Systems Products Division from Interactive Systems Corp., a subsidiary of Eastman Kodak Co. Interactive offers a version of Unix that runs on computers based on Intel's 80386 microprocessor, and, like Sunsoft's, its Unix is based on Unix Systems Laboratories System V Release 4.

Early this month, Sunsoft announced that the next version of its operating system, Solaris 2.0, would run on both Intel and Sun Scalable Processor Architecture (Sparc)-based systems when released in mid-1992.

The acquisition of Interactive would ensure such a schedule, according to analysts. "The acquisition is more than hedging Sun's bets; it will make Sun's schedule possible," said Peter Kastner, vice president of Aberdeen Group, a technology and market research firm in Boston.

A tight deadline

Judith Hurwitz, editor of "Unix in the Office," a newsletter from Patricia Seybold's Office Computing Group in Boston, said Sunsoft may have been able to develop the Intel part of Solaris 2.0 by itself, but next year's deadline "didn't give them a lot of time."

The deal came about in the last few weeks, according to Ed Zander, Sunsoft's president. Not only does Interactive bring Unix expertise on Intel platforms to Sunsoft, but the two companies have also been working together and share a similar vision of distribution on compact disc through indirect channels, as well as the inclusion of multimedia, said Interactive Chief Executive Officer Dennis Peck.

Interactive currently sells Sun's operating system for Sparc-based products on the open market.

Peck said the parts of Interactive that helped develop IBM's AIX operating system and Digital Equipment Corp.'s early Unix offering will remain under Kodak.

He said there are about 150 professional employees at Interactive but could not say how many of those would go along with the acquisition. Neither company would give a dollar figure for the merger's cost.

W. Y. S. I. W. Y. G.

The more things change, the more they stay the same

"Gaining credibility with top corporate brass is one of the principle challenges MIS managers will have to meet if they are to gain admittance to the ranks of top management." [CW, Sept. 21, 1981]

"The time has come for commercial DP users to consider developing in-house applications of artificial intelligence." [CW, Sept. 21, 1981]

READER'S CORNER
COMPUTER HAIKU

Computer on desk

Pigeons coo on window ledge

Life as endless loop

By Maury Horowitz and Jerome Weinberger
MIS, New York City Department of Transportation

• Pierre Barazer, left, president of IBM France, and Robert Fitzpatrick, president of EuroDisney S.A., signed a 10-year participant agreement for one of the 29 attractions in the EuroDisneyland Theme Park, which will open April 12, 1992 near Paris.

HE SAID IT

The time September 1987 **The place** PC Expo in New York

The person Michael J. Maples, who was at that time the director of software strategy and business evaluation for PC software in IBM's Entry Systems Division in White Plains, N.Y. (Maples is now a senior vice president at Microsoft Corp.)

The quote "Our intentions, both Microsoft and IBM, is that OS/2 will be a stabilizing, industrywide operating system ... [In 1995 the PC market will be] 95%-plus OS/2, the rest some unusual exception."

The reality By 1995, market share for DOS will be 82.5%, and OS/2 will be 6.3%, International Data Corp. projected.

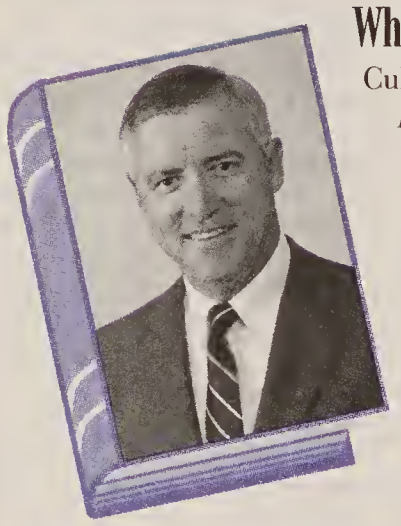
Gaffes & Goofs

From a business newswire:

The seventh graph, first line should read Intuit's Quicken (not Chicken) software.

The correct graph follows:

'Intuit's Quicken software automates bookkeeping for ...'



Whatever happened to ... John Cullinane?

Cullinane has just finished a book called *Managing a High-Tech Organization in Good Times and Bad,* subtitled, *Why did This Have to Happen to Me?* The book discusses the rise and fall of Cullinane's company, Cullinet Software, which ended with the company's being acquired by Computer Associates in 1989. The book — Cullinane said he is shopping around to agents and publishing houses — is meant as a how-to guide for executives in other software companies. Cullinane said "It includes everything I know." ***Well, maybe not everything.***

My son, the ~~doctor~~ ~~lawyer~~ computer scientist

A recent survey of 1,166 American adults by the University of Southern California and the University of California at Irvine rated the prestige of 740 U.S. occupations.

THE TOP 6 PRESTIGIOUS JOBS

1	Physicians	4	High government officials
2	College presidents	5	Lawyers
3	Astronauts	6	**Computer Scientists**

▶ Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Marie Haines

INSIDE LINES

But don't ditch that monitor just yet

▶ XGA will expand beyond the Micro Channel in the not-too-distant future. At Comdex this fall, the Video Electronics Standard Association (VESA) will circulate a draft of the specifications for AT-bus and Extended Industry Standard Architecture (EISA) versions of XGA, according to several sources. The sources said the AT and EISA versions look very solid and include a standard BIOS and an initialization standard for the applications programming interface.

Graphical user in-your-face

▶ Bill Gates isn't wasting any time worrying about Wordperfect's Windows product. Microsoft's Word for Windows has a current lock on the Windows word processing market, and Gates, at the Agenda conference in California last week, predicted that in two years, the firm would own 60% of the market — in spite of Wordperfect. Pretty hefty numbers for a company with only 16% of the character-based market.

Multimute

▶ Rumors abound that Ashton-Tate's Multimate word processor is not long for this world. Borland, which acquired the antique package in the Ashton-Tate buyout, is reportedly talking to Wordperfect about providing an upgrade path for Multimate. A Borland spokesman said that an announcement would be forthcoming on the state of Ashton-Tate products soon. Borland recently paid a pretty penny for NBI's Legacy windows word processing engine. If Borland is indeed getting rid of Multimate, analysts speculated, either the windows product is further away than originally thought, or Multimate's installed base is too small to be worth holding on to.

Net leader summit

▶ Presidents from smart-hub giant Synoptics Communications, router leader Cisco Systems and Sun Microsystems subsidiary Sunconnect will reportedly link arms before the analyst community next week. Consultants speculate that the firms will announce tighter network management integration of their products. Tighter integration efforts would be good news, one analyst said, for large users having "great problems using the diverse set of tools" now on the market.

Benign but terminal

▶ An article in the latest "Information System Security Association" newsletter contained a detailed breakdown of the costs incurred by a small environmental research company to eradicate a strain of the Jerusalem virus. Although the virus infected only seven PCs and two file servers, the costs in worker time and downtime amounted to more than $45,000, the article noted. The virus is considered benign by virus busters because it was not designed to cause intentional loss or destruction of data.

Prime rumor mill churns

▶ The rumor mill is working overtime these days in the Prime Computer community. There seem to be three lines of speculation: The Computervision side of the house will go public within the next 30 days; the Field Service Division of Prime will emerge as a separate third-party maintenance vendor; and perhaps the most persistent rumor involves Hewlett-Packard. Customers and industry insiders say that HP is interested in buying into some portion of Prime's proprietary minicomputer business.

The Chicago-based Corporate Association of Microcomputer Professionals got to watch some industry fisticuffs last week. Microsoft's Bill Gates started things off by asking the 1,200 attendees to compare Lotus 1-2-3/W and Excel 3.0 before they bought anything. Lotus' Jim Manzi followed with this shot: "Bill gave us a nice view of his vision of the future, and now I'm going to talk about the real world." The slender Lotus chairman also took a couple of shots at Borland Chairman Philippe Kahn's waistline. But Kahn stayed above the fray, except for a casual reference to "adequate" spreadsheets. For a good catfight, you can't beat the computer industry. Call Technology Editor James Connolly to let him know whose side you're on at (800) 343-6474, fax him at (508) 875-8931 or Compuserve him at 76537,2413.

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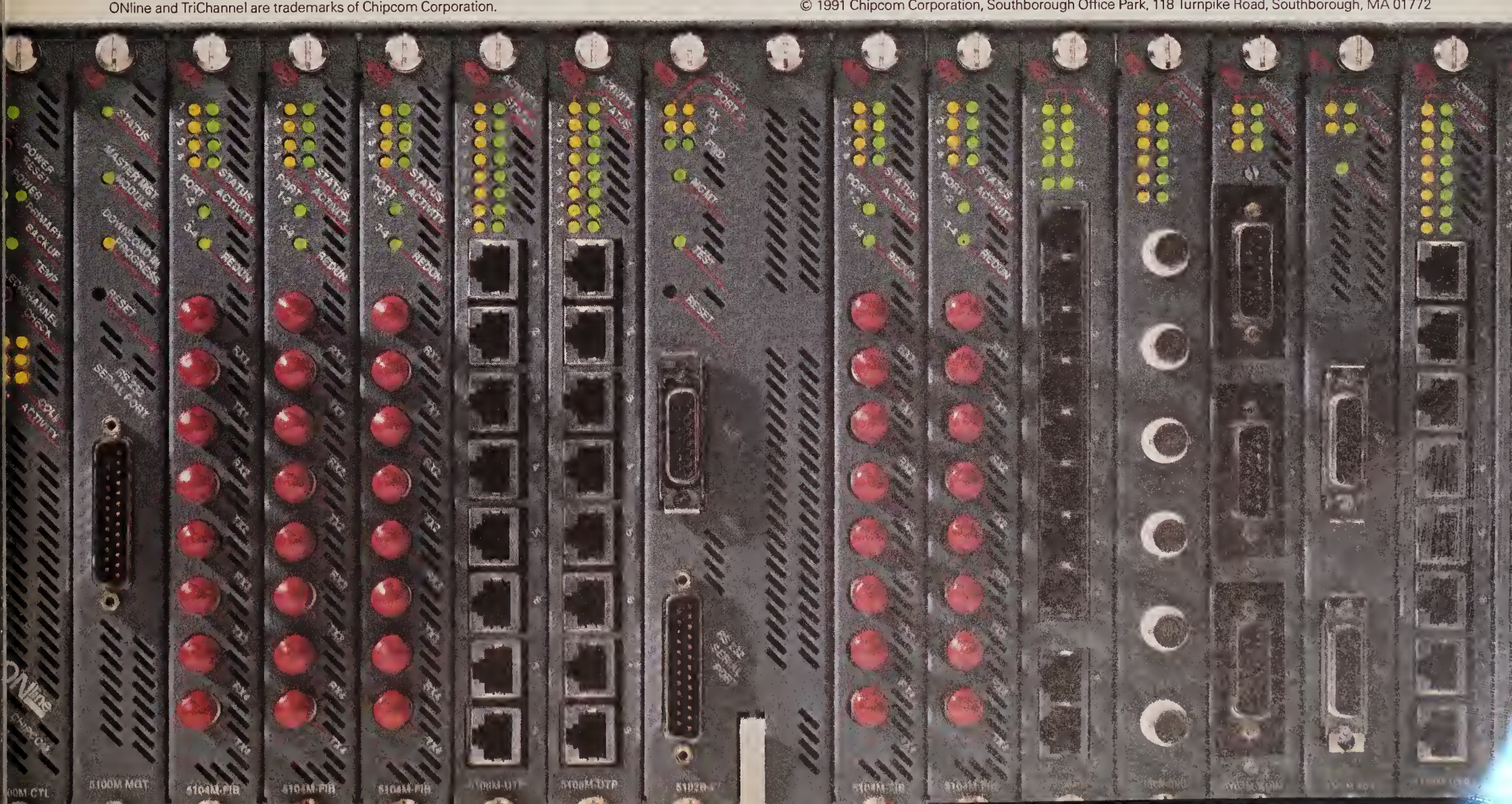

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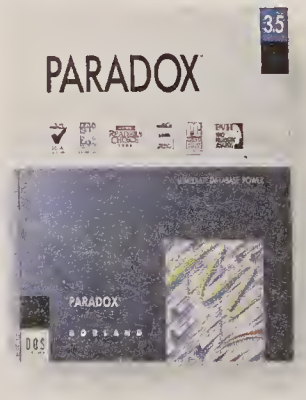

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